ZERO THEORY RESEARCH PROGRAM / IRCBHC

From Primordial Electron–Positron Pairs to Compact Seeds and Baryonic Matter

A Quantitatively Constrained Common-Mechanism Programme

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Scientific status and authorship. This author-review edition preserves the proposed causal picture and explicitly acknowledges the CURRENT R2C15 Core's cross-linked quantitative geometry, before evaluating any outside comparator. Several capacities, closure relations and pairwise relative coefficients are already internally locked; treating the six proposed consequences as six independently fitted parameter sets would be incorrect. These internal locks are not, by themselves, six calibrated observer-level predictions. Zero Theory describes the electron as an outward spacetime fountain and the positron as an inward vortex/time-sink, with an equal-and-opposite signed spacetime contribution under the project's declared symmetry assumptions. The surrounding environment matters: two inward structures embedded in an outward-dominant background may separate without that observation alone proving an intrinsic repulsive pair force. The author now proposes a prospective discriminating prediction: in suitably specified comparable conditions, effective positron–positron repulsion may be substantially weaker than electron–electron repulsion. No numerical force ratio is derived or measured here. A positron-rich concentration is conjectured to draw observer-accessible space and time inward, possibly providing a causal interpretation of an event-horizon-like boundary; this is not a derived metric or an observed origin of black holes. Known pair survival, numerical negative controls, energy/channel separation, standard-gravity comparators, conservation accounting, and falsification tests remain visible with their proper owners and scope. This is a source-traced author-review revision, not a new canonical Core release or a declaration of empirical confirmation. The particular Atlas-wide transfer from these locks to all six astrophysical outputs has not been independently certified from the full portable Atlas in this paper.

Research question

Could one explicitly derived and observationally mapped physical mechanism *govern pair-population evolution, possible compact-core formation and exterior structural filtering in both the early universe and suitably energetic stellar regions, without importing a different free law for each claimed output?*

Abstract

This research perspective asks whether the Zero Theory electron–positron spacetime asymmetry could supply a common causal route linking early pair populations, possible compact seeds, the observer-accessible geometry around such seeds, exterior structural filtering, and proton-like products, with a separate conditional application to energetic stellar regions. The author-defined ontology is central to the question: the electron's outward electric-facing structure is interpreted as generating accessible spacetime; the positron's outward magnetic-facing/inward-normal structure is interpreted as withdrawing that contribution from the material observer's viewing window. Under the project's declared mirror and equal-magnitude assumptions, their signed contributions cancel algebraically. The CURRENT Core additionally contains linked numerical capacity and phase-closure constraints and forbids independent adjustment of its factorized pairwise relative-response coefficients. Those established conditional consequences must not be mistaken for a measured metric, interaction force, or event horizon. An especially important environmental distinction is that apparent separation of two positrons in a fountain-dominated background need not be intrinsic pairwise repulsion. The author proposes a prospective experimental discriminator: matched, environment-controlled positron–positron measurements should exhibit substantially weaker effective repulsion than corresponding electron–electron measurements. The sign and quantitative ratio remain to be derived and independently tested; attraction is not assumed. A second interpretive hypothesis concerns inward transfer of observer-accessible spacetime toward a positron-rich sink as a possible origin of a one-way causal boundary. We preserve observed pair production and noninstantaneous positron survival as empirical inputs, not new problems for Zero Theory. Previously audited source–sink and phase-filter simulations retain their negative as well as conditional results. The standard Einstein–Maxwell charged-horizon bound is retained solely as a precisely scoped comparator for an idealized unneutralized rest-mass aggregate, not as a theorem about the native Zero Theory ontology. The energetic incident structure, observer-facing mass readout, charge/energy accounting, source-to-detection constraints, and independent cosmological tests remain separate. The six-stage inquiry is therefore not charged with six invented free coefficients; the test task is to transport already-locked native relations into pre-registered observable quantities, keeping unresolved instrument maps explicit. No particle-conversion, primordial-collapse, or horizon-formation mechanism is declared physically derived.

Keywords: Zero Theory; unifying dynamical hypothesis; primordial pair plasma; positron clustering; primordial black holes; stellar pair creation; positron-rich compact cores; black-hole magnetospheres; baryogenesis; identifiability; conservation laws; falsifiability.

1 Motivation: multiple questions, not multiple claimed solutions

A possible common origin is proposed for several questions: the fate of early positrons, the formation of some primordial compact seeds, the source of outward particle flows around black holes, the emergence of proton-like baryonic states, the later availability of electrons and protons for hydrogen formation, and (in the new extension) possible local pair production and proton-like outflows in sufficiently energetic stellar environments. These are *not five verified achievements*. They are potentially coupled explanatory targets. A successful shared law would have to predict their distinct observable consequences, while respecting established alternatives and their empirical support.

There is important established context. Electron–positron pairs are produced in high-energy electromagnetic interactions, including experiments interpreted as the Breit–Wheeler process [11]. Pair populations are present in the standard hot thermal history, and their annihilation and freeze-out have been quantitatively studied [12, 13]. Primordial black holes (PBHs) are an actively researched possibility, with nontrivial observational constraints [14, 15]. Stellar-mass black-hole formation is *not* an unexplained mystery awaiting this proposed mechanism. Nor is the reduced late-time positron abundance, by itself, a mystery equivalent to baryon asymmetry: ordinary $e^-e^+ \to \gamma\gamma$ annihilation already provides a well-established depletion channel. What remains interesting is whether the author can construct a distinguishable alternative route that survives all existing cosmological observations. The new stellar application is motivated by pair-instability physics in very massive stars, where thermal pair creation is a recognized contributor to changes in pressure support; that established mechanism is not evidence for positron self-concentration or microscopic black-hole formation [5, 6].

Scope control. The primordial scenario and the exterior filter are distinct *physical stages* of a proposed common mechanism, not six freely calibrated models. The canonical four-layer, arrival, phase and relative-coefficient relations supply shared upstream constraints. Whether the same locked inputs quantitatively predict compact seeds and new baryonic products is a separately scoped source-to-observable audit; juxtaposition alone is not evidence of the causal transition.

2 Definitions and ownership of claims

The available Zero Theory research corpus includes a four-layer electron architecture, a proposed positron mirror and an inside-out proton realization. The positron and proton are *not identical objects*. In the project's active terminology, the electron is described as an outward spacetime fountain; the positron's selected normal presentation and the relevant proton-L3 contribution are inward. These labels are *author-model definitions*: they are neither ordinary radial particle velocities nor automatically in-plane swirl, laboratory electric/magnetic fields, or general-relativistic curvature. In the CURRENT face-ownership convention, electron $E_{\text{out}}, B_{\text{in}}$ corresponds to positron $B_{\text{out}}, E_{\text{in}}$; the proton is a separate inverted-layer candidate, not the positron. The author-defined separation of field readout from interparticle causation is already in the Core (C20–C21) and must not be treated as an unrecognized objection. The project also treats the mapping of visible field readouts to the interparticle force law as a distinct, unresolved issue [16, 17].

The book *Existence and Nothingness* provides the related interpretation of an electric-associated creation event and a later magnetic-associated cancellation response [18]. Its exact-return ring construction establishes a conditional geometrical identity under prescribed orientations; it does not supply a physical metric, a positron attraction law or a black-hole dynamical operator.

Table 1: Epistemic status of the proposed chain at the present checkpoint.

Element	Status	Boundary of inference
Laboratory e^-e^+ creation	EMPIRICAL INPUT	Pair production and survival of positrons are observed; a specified cosmic abundance still requires modelling.
Shared four-layer capacities and pairwise coefficient closure	RESOLVED IN DECLARED SCOPE	Quantitative structural weights and relative coefficients are already linked; not six independent fits.
Electron 2830 construction	PARTIALLY RESOLVED	The numerical closure follows exact conditional construction/injection steps; the physical normalization is separately scoped.
Electron outward / positron inward normal	CURRENT MODEL GEOMETRY	Face ownership and normal orientation specified; operational map and metric remain open.
Sink-swirl numerical clustering	NUMERICAL TEST	Planar circulation and mobile centers are assumed.
Primordial positron-dominated black-hole seed	OPEN PHYSICAL BRIDGE	Survival is empirically possible; growth, environment-owned metric, transport and horizon formation not derived.
Exterior electron-to-proton-like filter	AUTHOR HYPOTHESIS	Requires a transformation law, particle identity and conservation ledger.
Structural energy vs. observed mass	CURRENT SEMANTIC DISTINCTION	Construction, accessible projection and inertial readout are different; common physical detector map OPEN.
Hydrogen-rich late universe from this route	OPEN COSMOLOGY	Needs nucleosynthesis, η, CMB and light-element tests.
High-energy stellar pair-to-core route	NEW AUTHOR HYPOTHESIS	Requires measured stellar pair sources, survival, charge balance and independent wind provenance.

3 Native spacetime picture: fountains, vortices and the environment

3.1 The author's distinction between field readout and interaction

The author does not identify the laboratory symbols "positive" and "negative" with a complete physical cause of attraction or repulsion. In the established Core's C21 distinction, one ledger describes the field observed from a knot, while a separate ledger concerns what changes the separation between knots. A field measurement may correlate with motion without alone identifying the deepest causal agency. This distinction is neither a denial of electromagnetic measurements nor a derived replacement for their quantitative laws. The standard Lorentz-force picture remains an empirical comparator, and Zero Theory must recover its tested domain or specify a measurable departure [16, 17].

The native structural assignment is more specific than a sign reversal:

$$(E_{\text{out}}, B_{\text{in}})_{e^-} \quad \overset{\mathcal{C}_Z}{\longleftrightarrow} \quad (B_{\text{out}}, E_{\text{in}})_{e^+}\,, \qquad \mathcal{C}_Z^2 = I. \tag{1}$$

The electric-associated action is interpreted as creation/presentation of existence and the magnetic-associated response as its delayed removal/withdrawal. In the author's symmetric same-measure construction, with the indicated frame and additive signed-rate convention,

$$\dot{\Sigma}_{e^+} = -\dot{\Sigma}_{e^-}, \qquad \dot{\Sigma}_{e^-e^+} = 0. \tag{2}$$

This is an exact conditional account under the model's matching assumptions. It does not state that electromagnetic SI field strengths are numerically equal, that fundamental structure ceases to exist when leaving an observer's window, or that equal-and-opposite increments already determine a metric or force law. In the author's book, the creation/cancellation return is supported by an exact conditional geometry of delayed coincidence, while physical identification with measured fields is a separate bridge [18, 16].

3.2 The lake and the difference between pair interaction and environment-mediated separation

The author's earlier illustrated essay, *The Lake That Boils Quietly*, is a prior explanation of the idea, not a new ad hoc response to the charged-horizon comparator [19]. Its lake surface represents spacetime available to an observer, *not water inside a pre-existing physical container*. The electron fountain supplies outward-presenting contributions. The positron vortex and the corresponding proton contribution are inward normal presentations, although the proton and positron have distinct structures. An inward contribution may leave an observer's viewing plane without entailing ontological destruction.

Here is the author's environmental intuition: two inward vortices located in a much broader field of outward fountains can be carried apart by the surrounding spacetime process. Their measured separation is then a result of the *whole environmental configuration*, not necessarily a direct repulsive interaction between the two vortices. The author points out that ordinary observed atomic structure contains protons and electrons rather than stable positrons as standard constituents; the proposed proton-side inward contribution and the electron-supported surroundings should not be conflated with an isolated positron pair. This contextual observation motivates specifying the environmental owner; it does not demonstrate that the actual large-scale laboratory background has a derived outward flow.

A distinction is therefore mandatory among (i) an intrinsic two-knot interaction, (ii) the motion attributed to the ambient creation/withdrawal balance, and (iii) the detector's reconstructed effective force. The existing two-dimensional source/sink toy explores a related analogy but does not itself derive these three maps.

3.3 A prospective author prediction: weaker effective positron repulsion

AUTHOR PREDICTION / PROSPECTIVE, NOT YET QUANTIFIED. The author expects that a dedicated, controlled comparison of positron–positron and electron–electron separation will find the former's *effective repulsive response* substantially weaker, when environmental spacetime effects and measurement conditions are properly specified. Attraction between positrons is *not* asserted. Nor is the prediction a universal force ratio independent of confinement, temperature, separation, relative velocity, or background fields.

The test must publish its observable before data selection: for example, independently reconstructed relative acceleration or pair-separation statistics at matched separations, velocities and controlled environmental conditions, with external trap fields, collective plasma density, cooling and instrumentation identified. The comparison must separate the intrinsic two-body candidate from transport due to the surrounding medium. In standard electrodynamics, the same-sign electron and positron Coulomb force laws have equal magnitudes at equal absolute charges and separations in the ideal comparator. An observed difference, if reproducible after these controls, would be discriminating. Existing positron plasma space-charge and rotating-wall compression records are empirical constraints; compression under external drive does not alone determine unforced pairwise force [21, 22, 17].

The model has not yet supplied a numerical effect size, error budget, unique background-mapping operator, or a frozen protocol capable of confirming or refuting this prediction. It must not be described as a measured discovery. The distinction between intrinsic and environment-mediated effects prevents either observed separation or observed compression from being counted automatically as proof of a specific microscopic force.

3.4 An inward spacetime-flow interpretation of a one-way boundary

A further author hypothesis is that a sufficiently concentrated positron-related inward branch can withdraw observer-accessible *space and time* toward a central sink. In that picture, light does not merely encounter a conventional force opposing its motion: its accessible propagation substrate and forward causal directions are proposed to be oriented inward. The question is whether a region could emerge in which no future-directed light path reconnects to the distant exterior, while inward access remains possible.

This is an *attempted causal explanation of an event-horizon-like property*, not a claim that a new observation has been made. Classical black-hole models already predict a one-way causal boundary. A spacetime-flow or river description can be written in general relativity; resemblance to such descriptions is a useful comparator, not a derivation that positrons generate the geometry. The project's current inward-normal statement refers to an observer-plane presentation; it is not already a physical metric, causal cone, or proof that the entire ontological spacetime is annihilated [16, 19, 3].

For this idea to reach a geometric prediction, the minimal missing object is an observer- and frame-labelled map from the signed creation/withdrawal process to causal propagation (or an equivalent measurable metric structure), including the location and directionality of any boundary. No particular coordinate speed, GR horizon radius, or positive-mass/charge identity is inserted as a Zero Theory premise by this paragraph.

4 Structural energy, accessible interfaces, and measured mass

4.1 The author's latest input clarification

A new signed supplement, *Appendix A — The Energetic Incident Structure and the Inverted Remainder*, v0.2, replaces an earlier *editorial* Appendix A for the black-hole-filter discussion [1]. It clarifies that the proposed incident object is an *energetic electron-side structured state*, not merely a laboratory electron characterized by a low-energy reported rest-mass value. The metaphor's "juice" is an energy account which may be redistributed between the structured remnant and its environment; its "seed" is a candidate *reconfigured remnant*, not a small preformed proton stored inside an electron. This interpretation is a statement of the author's model input, not evidence that the transformation is realized in nature.

The CURRENT Zero Theory semantic separation is *three-level* rather than a literal equation between construction energy and kilograms. For a declared structure Σ_X, accessible channel C, observer O and frame F, the existing bookkeeping architecture may be written schematically as

$$\boxed{\Sigma_X \quad \longrightarrow \quad \Pi_C[\Sigma_X] \quad \longrightarrow \quad \mu^{(C,F)}_{X|O} \quad \overset{\text{calibration}}{\longrightarrow} \quad m^{(O,C,F)}_{X,\mathrm{SI}}.} \tag{3}$$

Here Π_C denotes the observer-accessible projection, μ an unresolved relational inertial response, and the final arrow requires a stated operational instrument calibration. Equation (3) is a *CURRENT ontology/readout distinction*, not a completed physical law of mass. The same structure can have different accessible channels without the project licensing arbitrary observer-dependent masses. A measured proton at a given calibrated detector remains an empirical quantity and must be predicted consistently [16, 1].

4.2 The outer interface is not the entire four-layer energy budget

The proposed electron structure contains four retained physical layer identities. The electron's L1 is an important outer interface, but the CURRENT electron mass-readout branch explicitly permits L1/L2 competing channel accessibility; neither distance-dependent weight nor crossover is derived. After an inside-out positional inversion the physical layer identities are retained:

$$(L1, L2, L3, L4)_{\text{electron radial slots}} \longrightarrow (L4, L3, L2, L1)_{\text{inverted radial slots}}. \tag{4}$$

The proton's L3 is a *candidate material-observer-facing interaction/readout interface*; it must not be confused with "new outermost radial slot" or with the claim that only one layer remains physically. Under the CURRENT construction, the new proton L3 position inherits the old electron L2 wave-capacity owner; physical exposure of this candidate proton L3 channel remains an open dynamical/observational bridge. The internal layers can determine how the interface responds even if an external experiment accesses primarily the latter [16, 1].

The established proton-owned *candidate* relative index $\mathcal{M}_{p:e}^{\text{cand}} = (4\pi - 1)(4\pi)^2 = 1826.488\ldots$ must not be declared the measured $m_p/m_e \simeq 1836.153$; the same physical functional and common frame have not yet been derived for electron and proton channels. Nor does the candidate index quantify extra energy stored in an incident electron-side state. The bridge is **PARTIALLY RESOLVED / PHYSICAL MAP OPEN**, not "mass solved" or a new numerical fit [16].

4.3 Mass-readout distinction does not cancel a conservation constraint

The new clarification corrects a potential category error: one cannot infer the total construction energy of an incoming Zero Theory electron structure merely from a low-energy observed electron mass coefficient. However, *if* an outgoing remnant is identified by a standard asymptotic detector as a physical proton, the event must still satisfy the measured four-momentum and charge ledger. The conventional rest-energy contrast $(m_p - m_e)c^2$ remains a *comparison benchmark for specified asymptotic particle states*; it is *not* an independent definition of the model's internal construction energy, nor proof that a resting isolated electron is the actual proposed input state. A potentially energetic incident structure may carry additional specified incoming energy; the missing physics is how that energy, the environment and the outgoing channel exchange energy and conserved quantum numbers in one common frame.

Any new dynamical map must therefore report both $\mathcal{E}^{(F)}_{\text{construction}}$ and a separate $\mathcal{R}_O$ detector readout, with no unlabelled equality between them. No empirical prediction is credited before a single theory-to-observer map has been independently fixed.

5 One mechanism or a chain of extra assumptions?

5.1 The common-cause proposition

The author's central emphasis is not simply that a positron-rich region might precede a black-hole filter in a story. The CURRENT R2C15 graph already contains quantitative geometric dependencies; the question is how their locked consequences propagate into distinct observables. It is the stronger, falsifiable possibility that a *common physical rule* governing a structured electron–positron system could have several consequences under different boundary conditions: an outward-facing branch, an inward-facing branch, selective concentration, a compact gravitational seed, and eventually a distinct exterior structural response. A theory that explains all of those with one properly constrained dynamical law would have greater explanatory reach than a model requiring a new freely tuned operation at every transition. That increase in value is *conditional on the derivation and independent tests*; it is not credited for the number of phenomena merely named.

For clarity, split the shared input into $\Theta^{\text{locked}}_{\text{core}}$ (already declared and linked geometric/conditional constants) and u_i (independently observed environmental inputs for domain i). Remaining instrument or physical-transfer operators must be identified individually and must not silently be represented as stage-specific fitting constants. The desideratum, not a derived field equation, is a single law $\mathcal{D}_\Theta$ whose solutions supply multiple observer-mapped outputs:

$$\mathcal{D}_{\Theta^{\text{locked}}_{\text{core}}}[\Psi; u_i] = 0 \quad \Longrightarrow \quad \big(\mathcal{O}_{\text{collect}}, \mathcal{O}_{\text{seed}}, \mathcal{O}_{\text{exterior}}, \mathcal{O}_{\text{baryon}}, \mathcal{O}_{\text{cosmology}}, \mathcal{O}_{\text{stellar}}\big). \tag{5}$$

Here Ψ and $\mathcal{D}_\Theta$ are *schematic placeholders for a common physical evolution rule*, not newly introduced particles, a claim that this complete operator is already derived, or an invitation to freely retune the six outputs. Observer frames, field observables, units and state ownership would need to be supplied before using Eq. (5) predictively. The genuine unifying condition is that parameters fixed using one set of measurements then predict *distinct, held-out* observables in another set without unregistered stage-specific adjustments.

5.2 Quantitative locks already present in the CURRENT Core

The following are *retrieved CURRENT results*, not adjustable parameters newly proposed for this paper. Their claim scopes and resolution states come from the R2C15 Canonical Reasoning DB; the Knowledge Base and Master are scientific corroboration, with the DB authoritative for controlled edges and resolution state [16].

$$\begin{aligned}(w_{L1}, w_{L2}, w_{L3}, w_{L4}) &= (1, 4\pi - 1, 4\pi - 1, 1),\\ C_{\text{branch}} = 4\pi, \qquad C_{\text{both}} &= 8\pi.\end{aligned} \tag{6}$$

These weights are *ring capacities*, not the number of independent closure events, ordinary particle multiplicities, SI volumes or a newly fitted black-hole mass. The resolved capacity/event separation keeps one normalized arrival equal to one closure event, while allowing the response $R_i^{(1)} = \gamma w_{Li}$ under the declared common-input/readout convention, so $R_{L3}^{(1)}/R_{L1}^{(1)} = 4\pi - 1$ (node `ZT-RG-SINGLE-ARRIVAL-LINEAR-CAPACITY-RESPONSE-001`; **RESOLVED within model scope**). The common γ has no established SI-force interpretation in this result.

The six-channel saturation and inherited injection/closure steps generate, *conditionally and without using the target electron mass*,

$$N_{\text{build}}^{(\text{cont})} = 2829.1035760429859\ldots, \qquad N_{\text{closure}} = 2830, \tag{7}$$

with the exact arithmetic difference

$$\Delta N_{\text{closure}} = 2830 - N_{\text{build}}^{(\text{cont})} = 0.896423957014\ldots. \tag{8}$$

The construction node `ZT-RG-ELECTRON-2830-CONSTRUCTION-DERIVATION-001` is **PARTIALLY-RESOLVED** at the higher physical ceiling; the arithmetic remainder node is **RESOLVED**. The residual in Eq. (8) is a count difference. It is *not identified here with physical residual tension, curvature, a force or free energy*. Doing so would create a silent cross-quantity substitution.

The relative-response coefficient branch has *one factorized base*, not three independent constants:

$$\begin{aligned} &q_e = 1, \qquad q_p = (4\pi - 1)(4\pi)^2 = 1826.48803712175875\ldots, \\ &K_{ij} = \kappa q_i q_j, \quad K_{ee} = \kappa, \quad K_{ep} = \kappa q_p, \quad K_{pp} = \kappa q_p^2, \\ &K_{ep}^2 = K_{ee} K_{pp}. \end{aligned} \tag{9}$$

This **RESOLVED** conditional identity is registered in `ZT-RG-PAIRWISE-MASS-RELATIVE-COEFFICIENT-CLOSURE-001`. In that comparison geometry, q_p combines the L3/L1 capacity ratio with the specified relative-rate ratio; it is a candidate *relative-response index*, not the independently observed $m_p/m_e \simeq 1836.153$, nor three independently calibrated laboratory forces. The common normalization κ cancels in relative predictions but is not thereby fixed in SI units.

A further **RESOLVED-CONDITIONAL** branch gives completed integer phase closure

$$\Delta\phi = 2\pi n, \qquad n \in \mathbb{Z}, \tag{10}$$

with a registered conditional mismatch functional $U_{\text{closure}} = \min_m (\kappa_H/2)\delta_m^2$ and $\kappa_H > 0$ (`ZT-RG-H1-INTEGER-CLOSURE-SELECTION-RECOVERY-001`). This H1 condition belongs to the phase/atomic closure branch; it is *not silently the black-hole filter's acceptance operator or a horizon boundary condition*. Finally, the electron–positron face involution and signed equality of creation/withdrawal contributions are existing native constraints, not new adjustable charge signs (Section 3).

5.3 Six outputs: inheritance from locked inputs versus physical readout

Table 2: Source-traced parameter constraints and distinct held-out targets. A shared upstream lock does not establish the entire physical downstream pathway. "Not certified" is a statement of this paper's source audit, not automatically an OPEN-BRIDGE in the Core.

Proposed consequence	Existing inherited constraint / source scope	Held-out output requiring an operational prediction
Pair collectivity	Mirror-face map, opposite signed contributions; capacities constrain native normalized response	Matched e^+e^+ versus e^-e^- relative-separation or collective-response distribution after environmental controls
Compact seeds	Same inward/outward architecture; no independent capacity weight per seed	Seed growth, mass spectrum, abundance and a one-way boundary, from independently specified physical conditions
Exterior filter	Retained four-layer identities; phase-invariance and source-exact negative phase-gate control	Outgoing composition and spectrum distinguishable from acceleration of pre-existing matter
Proton-like output	Preserved layer identities after inversion; q_p/q_e and factorized K candidate	Detector-identifiable proton properties and production count with conserved external ledgers
Cosmology / hydrogen	Conditional H1 integer closure and inherited four-layer phase/capacity relations	Blind BBN, CMB, baryon abundance and ionization predictions, not target-fitted
Stellar extension	Same native inputs under separate measured stellar boundary/source terms	Pair-rich region survival, source-resolved novel particle component versus ordinary stellar transport

No arbitrary six-parameter charge is assessed. The Core locks above were already derived/declared upstream. A future manuscript criticism of unconstrained parameters must name a specific free coefficient, its existing dependency

path, its permitted domain, and why no CURRENT relation fixes it. The separately imposed planar $\gamma_{\text{sink}} = -0.024$ in the historical two-dimensional analogy is *a toy input*, not evidence that the physical six-stage theory owns an independently fitted γ at each stage. Similarly, conditional response normalizations κ and κ_H should be documented at their exact scopes, not multiplied into a blanket six-stage freedom count.

5.4 Distinct questions and non-duplicated evidence

Table 3: What a single mechanism would have to add beyond merely connecting narrative stages. These are targets and constraints, not present results.

Question	Proposed shared route	Independent quantitative requirement
Where did early positrons go?	A selective inward response and/or trapping	Population balance against e^+e^- annihilation, radiation and expansion; predicted residual signals
Could primordial compact seeds form?	Collective concentration followed by gravity	Charge-consistent stress–energy and horizon criterion; predicted mass function and abundance
Why are there black-hole-associated outflows?	An exterior structure-selective response	Particle spectra, composition and energetics distinguishable from accretion and ordinary jets
How might proton-like states arise?	A specified four-layer rearrangement	Identifiable proton readout, full charge/energy/quantum-number ledger and event rate
How could hydrogen become abundant?	Residual electrons plus genuinely produced protons	Matter abundances, BBN timing, CMB and ionization history without target-fitted corrections
Could a stellar pair-rich zone host compact cores?	The same collective dynamics under a new local boundary condition	Independent stellar pair source, losses, compactness and a distinct particle-origin signal

The targets are *not independent evidence merely because they are listed separately*. The assumed early pair population, the same numerical source–sink calculation, or parameters calibrated to late-time abundances may be reused upstream. An evidential audit must mark such shared information; otherwise five apparent "confirmations" may reduce to one repeated premise. Conversely, a genuinely new prediction across distinct instruments and epochs would have substantial value.

5.5 Explanatory economy is a requirement, not a result

The pertinent audit is no longer an unqualified claim that every transition needs its own arbitrary parameter. The CURRENT Core already fixes several capacities, conditional counts and relative coefficients. The remaining task is to trace, for each proposed observable, whether an existing physical/observer map actually uses those same inputs. A map that has not been located in the present source audit is *not automatically an open scientific bridge*; it first requires source retrieval and cross-file verification. Only a specifically identified independent adjustment of a documented model coefficient could support a free-parameter criticism. Independent, held-out outputs remain the appropriate test of cross-stage transfer.

Current verdict: The supplied R2C15 Core supports a **QUANTITATIVELY CONSTRAINED INTERNAL ARCHITECTURE**, not six independently adjustable parameter sets. A complete, empirically calibrated six-output dynamical transfer has not been established by the *sources examined for this manuscript*. The latter is an evidence-ceiling statement, not a declaration that the author must rediscover or re-derive already stored Core results.

6 The two-stage research architecture

6.1 Stage I: early pairs, segregation and compaction

The starting working assumption is an early environment with large numbers of electrons, positrons and photons. The author's previously defined asymmetry and the environmental argument in Section 3 motivate a possible different collective fate for outward-presenting electrons and inward-presenting positrons. A positron-rich compact seed is a proposed outcome, not a consequence of the sign convention alone. In particular, local separation must be decomposed into pairwise and environment-mediated contributions. Quantitative transport, source/loss balance, physical compaction and a common observer-map remain future calculations; none require pretending that positrons are experimentally known to annihilate instantly.

6.2 Stage II: an exterior structural filter

If a sufficiently compact object actually forms and possesses an event horizon, a second proposed mechanism operates on incoming electron-like structures *outside the horizon*. The proposed incident object is now explicitly an energetic electron-side structure with a frame-owned energy account, rather than an electron defined only by its low-energy rest-mass readout (Section 4). The author imagines selective capture or energy redistribution, a change in structural presentation, and an outgoing proton-like configuration. This stage is distinct from Hawking radiation, conventional jets or ejection from an accretion disc. A genuine distinguishing prediction must refer to detectable outgoing particle properties, not merely a change of a symbolic name [28, 29, 23].

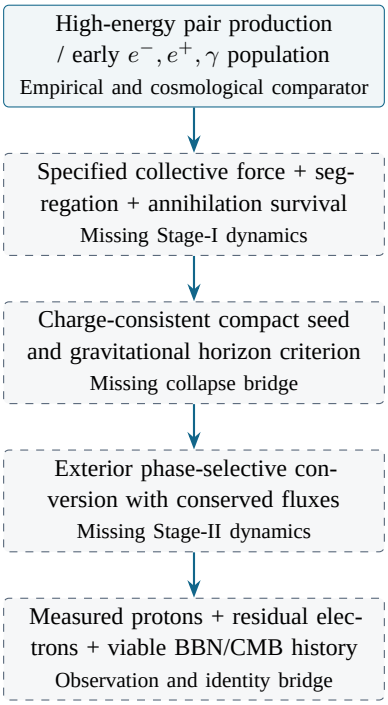

Figure 1: Proposed dependency chain. Solid arrows indicate required logical transitions; they are *not* established physical processes. The fixed Core capacities and phase/relative-response constraints in Section 5.2 are inherited upstream, rather than fitted independently along this schematic chain. Broken-outline boxes indicate physical transfer or observational mapping not certified as complete in this paper; this does not re-open resolved Core algebra.

7 New extension: can the same conjecture operate inside a star?

7.1 Scope of the author's Appendix A

A newly supplied, signed companion manuscript—*Appendix A: Stellar Pair Creation, Positron-Core Concentration, and a Conditional Proton-Producing Filter*, version 0.1, dated 20 November 2026—asks whether the preceding two stages might operate *locally inside a star*, not only in a primordial cosmological setting [4]. This is a **USER HYPOTHESIS / OPEN TEST**; it is not a new consequence of the current four-layer equations. The same physical law would have to apply with separately measured stellar temperature, radiation spectrum, density, transport, geometry and boundary conditions. A claim restricted to an unspecified "hot star" is not an adequate source term.

The well-studied *pair-instability* of very massive stellar cores shows why the source question is scientifically concrete. High-energy photons can create electron–positron pairs in certain late evolutionary phases of massive stars, altering thermodynamic support and, in some regimes, driving pulsations or disruption [5, 6]. The standard pair-instability mechanism is *not* self-gravitating clustering of a positron-only population. The source rate and distribution must be estimated for the particular selected domain and cannot be assumed to apply inside ordinary main-sequence stars, the contemporary Sun, or arbitrary stellar layers.

7.2 Source and survival budgets are not an attraction law

Define a selected observer-owned local frame, physical volume and time variable, with local pair injection rate $\mathcal{R}_{\pm}(\mathbf{x}, t)$ in $\mathrm{m}^{-3}\mathrm{s}^{-1}$. In an admissible pair-production event, both species enter equally before subsequent reactions and transport. The companion appendix records the minimal inventories

$$\partial_t n_+ = \mathcal{R}_{\pm} - \mathcal{A} - \nabla\cdot\mathbf{J}_+ - \mathcal{C}_+, \tag{11}$$
$$\partial_t n_- = \mathcal{R}_{\pm} - \mathcal{A} - \nabla\cdot\mathbf{J}_- - \mathcal{C}_-, \tag{12}$$

where $n_{\pm}$ are locally measured number densities, $\mathbf{J}_{\pm}$ number fluxes, $\mathcal{A}$ a two-species depletion term, and $\mathcal{C}_+$ and $\mathcal{C}_-$ transfers into specified non-free populations. These are *inventory identities*, not a derivation of the fluxes, the trapping process, or a force law. The existence and laboratory storage of positrons already establish that pair creation does *not* imply immediate annihilation of every positron. No novel theory is required to reproduce that elementary survival fact; the only relevant new question here is whether a stated astrophysical domain has net concentration under its actual sources, losses and environmental dynamics. In particular, the numerical point-sink coefficient from the lake analogy cannot determine $\mathcal{C}_+$. For a proposed compact core k, the independent growth constraint can be written

$$\frac{dN_{+,k}}{dt} = \int_{V_k} \mathcal{C}_+\, dV - \mathcal{L}_{+,k}, \qquad \frac{dN_{+,k}}{dt} > 0 \text{ for sustained growth.} \tag{13}$$

$\mathcal{L}_{+,k}$ includes escape, reactions, transport, and other specified losses. The source and all loss terms must come from independent physical laws or measurements, and any concentration timescale must compete with annihilation and redistribution. Eq. (13) is a necessary accounting condition, not a computed collapse criterion.

7.3 A conditional Einstein–Maxwell comparator, not a native Zero Theory no-go theorem

The stellar appendix distinguishes a compact positron-rich center from an actual horizon. The next equations assess a deliberately *different and narrowly defined comparator*: an isolated, stationary, unneutralized assembly of standard-model point positrons, with total gravitating mass identified with the sum of measured positron rest masses, and standard Einstein–Maxwell geometry. *These are explicit assumptions of the comparator, not definitions of the Zero Theory sink.* For a stationary, nonrotating Einstein–Maxwell Reissner–Nordström black hole of gravitational mass M and electric charge Q, existence of a horizon requires [7, 8]

$$\frac{|Q|}{M} \le \sqrt{4\pi\varepsilon_0 G} \simeq 8.62 \times 10^{-11}\ \mathrm{C\,kg^{-1}}. \tag{14}$$

By contrast, a simplified aggregate of N *unneutralized positrons*, whose *only* gravitating mass is their sum of rest masses and whose charge remains Ne, has the fixed ratio

$$\left(\frac{Q}{M}\right)_{Ne^+} = \frac{e}{m_e} \simeq 1.76 \times 10^{11}\ \mathrm{C\,kg^{-1}} \simeq (2.04 \times 10^{21})\sqrt{4\pi\varepsilon_0 G}. \tag{15}$$

The standard comparator so defined is over-extremal under its own assumptions. This result cannot be transferred automatically to the author's observer-owned creation/withdrawal ontology: its external electric-charge readout, total gravitating energy, metric and horizon operator have *not* been identified with the above inputs. Conversely, changing a causal interpretation does not by itself erase measured external charge or the need to compute an actual light-cone boundary. The correct cross-theory task is to derive the instrument-facing charge and metric for the author's candidate and then apply both measurement constraints and a declared comparator. The present paper claims neither that the standard assumption set applies to the Zero Theory center nor that the proposed center has already been shown to possess an event horizon. The numerical lake radius is not an observed compact-object radius.

7.4 Output accounting: observed stellar protons are not necessarily newly produced

The next proposed step is an exterior structural filtering process yielding a proton-*like* candidate p^*, and the appendix defines the schematic outward count

$$\dot{N}^{\mathrm{out}}_{p^*}(t) = \varepsilon_{\mathrm{esc}}(t)\, \mathcal{F}_{e\to p^*}(t), \tag{16}$$

where neither the conversion rate $\mathcal{F}_{e\to p^*}$ nor the escape fraction $\varepsilon_{\mathrm{esc}}$ is yet derived. In the standard picture, observed solar-wind protons and electrons are predominantly transported coronal plasma, including ionized hydrogen; an observed proton moving outward is *not* an observation of a proton being created from an electron [9, 10]. For the alternative claim to be testable, the model must predict a *new source component*, source region, production rate, composition/energy spectrum and independent distinguishing signal rather than re-label pre-existing ion outflow.

As in the primordial proposal, replacing a specified initial physical electron state by an outgoing physical proton changes the particle charge ledger by $\Delta Q = +2e$; the measured rest-energy contrast is about $937.761\,\mathrm{MeV}$ for the corresponding asymptotic states, before kinetic and other products. This is a comparison constraint, not an equation identifying the proposed incident structure's full construction energy with laboratory electron rest energy. The surrounding environment may carry compensating contributions, but it must be declared and calculated; a stored positron provides only $+e$ charge and cannot on its own supply the entire $+2e$ difference. Particle identity additionally needs mass, spin, scattering and detector readout, not the Python statement `Proton()`.

7.5 Cross-domain test: genuine unification or two separately tuned stories?

If the author intends *one mechanism*, a physically stated parameter set Θ must govern both early-universe and stellar-domain predictions, allowing measured environmental conditions to differ but prohibiting unrelated freely adjustable laws for pair sources, forces or conversion in each domain. Independent constraints on pair source and annihilation are required *before* fitting a proton-outflow target. The stellar branch adds a possible *new falsification channel*, not an automatic extra confirmation. **Status at this revision:** the supplied stellar appendix is an important *new application*

Table 4: Stellar-extension audit: observations, missing links and early stop conditions. All proposed new-physics results are currently open.

Proposed step	Independent required input / observable	Stop condition or negative comparison
Stellar pair injection	Local $\mathcal{R}_{\pm}(T, \rho, \text{spectrum})$ and uncertainties	Insufficient local supply, or assumed injection calibrated from desired outflow
Selective e^+ survival	$n_{\pm}$, $\mathcal{A}$, transport and concentration times	Annihilation, dilution or charge restoring effects preclude net growth
Compact-center formation	Physical mass, Q/M, rotation, stress–energy and horizon analysis	Only normalized numerical compaction; overcharged unsupported horizon
Exterior filter event	Defined phase and dynamics, causal exterior trajectory	Only a programmed transformation or forbidden horizon crossing
New proton-like output	Independent hadronic identity and source-to-wind excess	Ordinary accelerated or ionized stellar plasma explains same signal
One-law hypothesis	Fixed shared Θ across cosmological and stellar settings	Each environment needs a new unmeasured tuning parameter

hypothesis and more stringent test plan, but none of its proposed production, micro-horizon, or proton-origin stages has been observed or derived. The companion appendix is retained source-exact in the reproducibility pack, while this paper synthesizes its implications without upgrading its epistemic status.

8 What the existing source–sink simulation establishes

The author supplied a two-dimensional hydrodynamic analogy of 120 outward point sources and 120 inward point sinks with matched initial positions between two numerical conditions [20]. Each center is assumed to move at the velocity generated by all other centers, with regularization $\epsilon = 0.055$ and normalized time. The imposed equation is

$$\dot{\mathbf{x}}_i = \sum_{j\neq i} \frac{q_j(\mathbf{x}_i - \mathbf{x}_j) + \gamma_j\,\hat{\mathbf{z}} \times (\mathbf{x}_i - \mathbf{x}_j)}{2\pi\big(\|\mathbf{x}_i - \mathbf{x}_j\|^2 + \epsilon^2\big)}. \tag{17}$$

Here $q_j = \pm 0.012$ is a *planar source or sink strength*, not electric charge, and γ_j is a separately prescribed *in-plane circulation*; neither is an externally calibrated Zero Theory field. The reference plane, lengths and time are numerical conveniences, not physical spacetime ontology.

In condition A, $\gamma_j = 0$. Both populations spread. In condition B, the sink circulation is assigned $\gamma_{\mathrm{sink}} = -0.024$, while sources have zero imposed circulation. With the same seed (20261116), the sinks shrink in RMS radius about their own

centroid from 0.5168 to 0.2688 in B, but expand to 0.9253 in A. Reversing the sign of the imposed circulation reverses angular direction, demonstrating that the handedness is controlled by input assumptions. An anchored-center control would show no cluster migration at all. This is a genuine numerical *conditional consequence* of Eq. (17); it is not a simulation of a relativistic positron plasma or a physical event horizon.

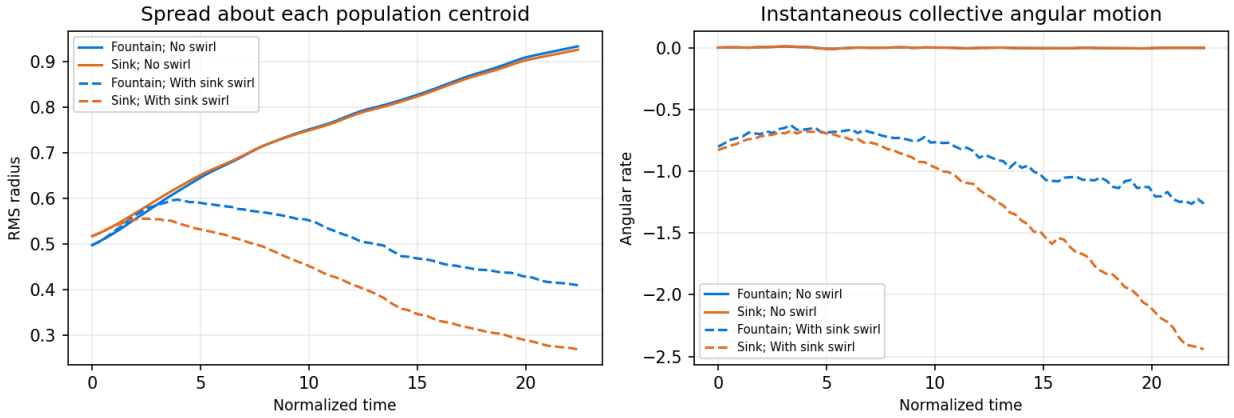

Figure 2: Source–sink analogue supplied in the project's numerical research. Solid traces have no planar circulation; dashed traces add an *imposed* clockwise sink circulation. Decreasing RMS spread in the dashed sink curve is not a derived positron attraction or a gravitational collapse. Axes are normalized. Source: author-supplied Python model and CSV, reproduced without relabeling the physics.

Non-identifiability warning. The preceding result cannot decide the sign of the physical positron–positron interaction. The dynamical law, self-field, frame, unit map and constitutive translation are all missing. It would be methodologically invalid to vary these unknowns until the model "discovers" a desired cluster, then present it as evidence for its initial assumption.

9 Experimental comparison: intrinsic and environment-mediated positron behavior

For an isolated ideal same-sign pair at the same separation, ordinary electromagnetism predicts equal magnitudes for electron–electron and positron–positron repulsion. This is a clear *standard-theory prediction*, not an assumption to be copied into Zero Theory's causal ontology. Positron plasmas have measured space-charge response and collective motion, and externally imposed rotating-wall compression has been demonstrated [21, 22]. Those observations matter; however, the reconstruction of intrinsic pair forces from collective, driven measurements must state its trap, transport, density, background and model assumptions. No dedicated direct two-free-positron versus two-free-electron force comparison has been established as a new result by this manuscript.

The author's prospective alternative, set out in Section 3.3, is not an unqualified claim of positron attraction: effective outward separation between two inward structures may be environment-mediated. A fair test therefore seeks a *fixed protocol and signed observable* that distinguishes direct same-species interaction from the effective influence of a fountain-dominated background. We cannot simply rename a collective effect "direct attraction" or "direct repulsion." Equally, the author's view does not entitle the model to disregard measured potentials, detector calibrations or the known success of electromagnetism. The theory must eventually reproduce or clearly deviate from their actual quantitative readings.

If pair species segregate into a positron-rich center and electron-rich surroundings, the observer may still detect an electromagnetic potential and an energy budget. The inward-normal ontology is not a proven neutralizer of that operational field. This is a measurement/accounting requirement to be evaluated after deriving the native field-to-instrument map, *not* a prior refutation derived from a sign convention.

10 A minimal physical model and its required inputs

A physical primordial programme would require distribution functions for each species in a declared cosmological spacetime. A schematic kinetic architecture is

$$\frac{\partial f_s}{\partial t} + \mathbf{v}\cdot\nabla_x f_s + \mathbf{a}_s[f_-, f_+, g_{\mu\nu}]\cdot\nabla_v f_s = C_s[f] + S_s^{\gamma\gamma} - A_s^{e^-e^+}, \qquad s \in \{-,+\}. \tag{18}$$

This equation is *a bookkeeping template*, not a derived Zero Theory evolution equation: the collision terms, pair-production source, annihilation sink, physical acceleration law, and metric are all inputs that must be specified. In particular, adding a sign that makes positrons converge would predetermine the answer unless that sign independently follows from the ontology and a separately testable law.

A candidate density perturbation must grow faster than relevant competing processes. At minimum, its characteristic growth must be compared with cosmic expansion, annihilation, diffusion and the electric restoring response; in a schematic notation,

$$\Gamma_{\text{cluster}} \overset{?}{>} \max\{H, \Gamma_{\text{ann}}, \Gamma_{\text{mix}}\}, \tag{19}$$

where the rates are yet uncalculated in the proposed model. This inequality is a proposed *success condition*, not a result. Likewise, a compact object must satisfy an appropriate gravitational collapse criterion in the physical metric, rather than merely having a decreasing normalized planar RMS radius. The commonly used compactness $2GM/(Rc^2)$ is only a rough comparator for sufficiently specified relativistic configurations, not a universal theorem for arbitrary nonstationary charged matter.

11 Two filter implementations: negative code path versus conditional accepted toy

The new author-supplied editorial appendix preserves a point that can be lost when the working programs are recounted as one simulation [1, 23]. In the original German–Persian source, an incoming electron has phase $+1$ while the filter requires -1. The default execution *rejects* the input. That is an audited **PASS for code-path reproduction / FAIL for default conversion**, not a measurement of phase-selective gravity.

A later 101-ring numerical story begins with a deliberately prepared accepted input phase and assigns energy partitions and an envelope reversal. Its 101 rings are *numerical microstructure variables*, not the four ontological electron/proton layers. If the assigned extraction fraction is η, the toy applies

$$\omega_j' = \sqrt{1-\eta}\,\omega_j \quad\Longrightarrow\quad \frac{\omega_i'}{\omega_j'} = \frac{\omega_i}{\omega_j} \qquad (\omega_j \neq 0), \tag{20}$$

whereas the CURRENT four-layer conditional theorem instead states

$$\omega_j' = \omega_j + \Omega_C \quad\Longrightarrow\quad \omega_i' - \omega_j' = \omega_i - \omega_j. \tag{21}$$

Equation (20) preserves *ratios under a common multiplier*; Eq. (21) preserves *differences under a common additive shift*. They are distinct exact conditional identities. The latter has a registered resolved algebraic status in the CURRENT project; neither provides a strong-field transformation generator or experimental evidence of proton creation.

For the archived accepted toy run, the normalized structural input total is 0.5465625, the remaining outgoing account 0.3237984375, and the assigned environmental gain 0.2227640625. Their exact sum closes *because the allocations were prescribed*, not because a physical black hole was integrated. The toy assigns the envelope reversal and outgoing branch; it does not dynamically generate either. The original rejected-input result and the later accepted conditional result must remain separately versioned and traceable [1, 23].

12 Pre-horizon conversion and measurable conservation accounting

The two illustrative algorithm branches are distinguished in Section 11. The historical phase gate rejects the default electron; the later 101-ring branch accepts its prepared input and conserves assigned numerical accounts. Neither produces a proton by independently derived field dynamics. Labels such as “convex”, “concave” or “topological” require a physical invariant and transformation law before they establish a topological change [23, 24, 1].

The measurable proton is positively charged, baryonic and much more massive than the electron. For a narrowly specified asymptotic comparison of one incoming physical electron with one outgoing physical proton—*not* an identification of the full Zero Theory construction energy of an arbitrary energetic incident structure—the following channel differences constrain any physical event [25]:

$$Q_{\text{in}} = -e, \qquad Q_{\text{out}} = +e, \tag{22}$$

$$\Delta Q_{\text{particle}} = +2e, \qquad Q_{\text{other channels}} = -2e, \tag{23}$$

$$\Delta E_{\text{rest}} = (m_p - m_e)c^2 \simeq 937.76\ \text{MeV}, \tag{24}$$

$$\Delta B_{\text{particle}} = +1, \qquad \Delta L_{\text{particle}} = -1. \tag{25}$$

The energy line is a measured standard-particle rest-energy contrast, not a law equating internal structural energy to observed rest mass. The balance on the second line follows from electric charge conservation if the initially considered channel consists of exactly one electron and one proton. Other particles, field fluxes or changes in the black-hole/environment reservoir must carry the compensating quantities. An exactly neutral initial $e^- e^+$ collection cannot yield a net positive visible product without balancing charge elsewhere. Baryon and lepton number are further independent questions; a novel violation mechanism, if proposed, must be stated explicitly and checked against experiment and baryogenesis constraints [26, 27].

A minimal frame-labelled energy ledger for the energetic-input hypothesis, still *not solved*, is

$$\mathcal{E}^{(F)}_{\text{in}} + \mathcal{E}^{(F)}_{\text{env, before}} = \mathcal{E}^{(F)}_{\text{remnant}} + \mathcal{E}^{(F)}_{\text{env, after}} + \mathcal{E}^{(F)}_{\text{other outputs}}, \tag{26}$$

provided F and the translation of all channels into a common energy accounting are defined. This bookkeeping equation is not a physically derived energy-transfer solution. No normalized toy extraction fraction determines the terms; no term is a detector mass until the observer map is supplied [1].

A physically meaningful candidate map must be located outside the horizon if it is to return material to the same classical exterior:

$$\mathcal{T}_{\text{ext}} : \quad (X_e, X_{\text{BH}}, X_{\text{env}}) \longmapsto (X_{\text{rem}}, X'_{\text{BH}}, X'_{\text{env}}), \qquad r > r_+ \text{ in a declared exterior chart.} \tag{27}$$

The state X must carry four-momentum, charge, relevant quantum numbers, physical layer identity, frame ownership and a detector map. Existing Blandford–Znajek and accretion-jet mechanisms permit energy and plasma outflows from the near-hole environment; they do *not* establish electron-to-proton conversion [28, 29]. A claim of emergence from inside a classical event horizon would require a different, explicitly defined causal model.

13 Observed black-hole outflows: an empirical anchor, not an observed structural conversion

High-resolution images of the M87* central emission region and polarized observations constrain the surrounding emitting plasma and magnetic-field geometry. Observed jets in active galactic nuclei and other accreting systems are genuine outward plasma/energy flows associated with compact-object environments [29, 2, 3]. These observations are valuable *comparators* for any proposed near-hole exterior process. However, an image is a measurement of radiation and its spatial/polarimetric structure, not a time-resolved recording of one incoming electron transforming into one outgoing proton. Jet composition, acceleration, source population and production versus entrainment require separate constraints. In particular, neither the image nor its polarization alone verifies an electron-to-proton topology inversion.

The author's latest two-file editorial submission contains the signed energetic-input manuscript and its integration pack, but *no new telescope image, event-level particle-identification record or observational dataset.* Accordingly, the manuscript records **EMPIRICAL INPUT: OBSERVED OUTFLOWS**, while **OPEN TEST: IN-SITU NEW PROTON CREATION** remains unchanged. It would be a target-leakage error to use the mere existence of jets to fix an unmeasured conversion efficiency and then count the fitted jet as confirmation of that efficiency.

A meaningful additional test would demand a source-region-resolved prediction for outgoing particle composition and energy, a physical discriminator against ordinary electromagnetic acceleration/entrainment, and explicit instrument modelling with uncertainties. This section does not claim that present astrophysical instruments can tag a unique electron-to-proton event near a black-hole horizon.

14 Cosmological consistency: necessary downstream checks

Even if both local stages could be made dynamical, a successful origin scenario must reproduce the measured universe. Required tests include (i) the primordial abundance and allowed mass spectrum of compact objects, subject to evaporation and lensing constraints [14, 15, 31]; (ii) matter and radiation histories consistent with CMB inference and primordial light-element abundance [32, 13]; (iii) a consistent net baryon-to-photon ratio, commonly inferred around 6×10^{-10} within the relevant standard framework [13]; (iv) astrophysical and cosmological annihilation signals of any surviving positron reservoirs; and (v) a physical explanation for charge neutrality of large-scale matter.

These observables share some common decisive empirical inputs. A fit to an output that was already used to calibrate the model is not an independent confirmation. It is essential to separate detector measurements, reconstructions and downstream comparator assumptions, and to freeze model parameters *before* analyzing discriminating observations.

15 Joint tests that could distinguish unification from storytelling

A useful test should not first fit the positron dynamics, then independently fit the black-hole seed masses, and finally fit the ejected baryon distribution. It should fix a common physical parameter set on a *declared training subset* and report untouched predictions, uncertainties and possible failure on another subset. At minimum, this would require:

1. **Laboratory channel:** an independent signed positron-collective response, with traps, external field torques, cooling and measurement reconstruction made explicit. The existing compression and space-charge records are inputs; their model-based reconstruction is not re-counted as a separate test of the same assumed force.
2. **Early-Universe channel:** independently computed reaction, annihilation, segregation and cosmological expansion timescales; a charge and energy budget; and a primordial compact-object spectrum subject to PBH limits [12, 15].
3. **Exterior conversion channel:** a causally admissible pre-horizon operator that predicts *newly created*, detector-identifiable protons with a charge/energy/baryon ledger; a discriminant against pre-existing baryons merely accelerated in an accretion flow [28, 23].
4. **Stellar extension channel:** for a named high-energy stellar domain, predict the pair source and loss budget, any compact-center growth and a newly created proton-like component with the *same* shared law. Compare with ordinary pair-instability evolution and coronal/stellar plasma outflow, without using the observed wind count to define the conversion rate [5, 9].
5. **Cosmological consequence channel:** baryonic abundance and light-element composition forecast before using the target observations, checked against BBN and CMB constraints [13, 30, 32].

An explicit negative outcome is valuable: if a shared parameter set that fits the laboratory channel fails the independently measured cosmic channels, the proposed common-cause law is disfavored or falsified in that domain. Likewise, if the remnant cannot preserve charge and energy under any admissible exterior coupling, the claimed proton-production step fails without invalidating unrelated earlier assumptions. The distinction between *conditional exploration*, *retrospective fitting*, and *prospective prediction* is compulsory.

15.1 Prospectively frozen, parameter-linked evaluation windows

The protocol's immutable upstream packet is $\Theta_{\text{core}}^{\text{locked}} = \{w_{Li}, N_{\text{closure}}, \Delta N_{\text{closure}}, q_p/q_e, K_{ep}^2/(K_{ee}K_{pp}), \Delta\phi/2\pi\}$ *with each element restricted to its registered node scope*. These dimensionless internal quantities are not declared mutually independent evidence and are not automatically SI observables. For each proposed test, archive the Core release/hash, source node IDs, upstream dependency closure, the exact forward observable operator $\mathcal{M}_i$, the measurement frame and units, environmental inputs u_i, permitted calibration set, withheld samples, uncertainty interval and a pre-declared PASS/FAIL/INCONCLUSIVE rule. Do not fit $\mathcal{M}_i$ to the reserved outcome.

A failure of one specific test falsifies the *frozen observable claim* within its stated applicability, not every algebraic identity from which its inputs were drawn. Likewise, a successful numerical equality reused across channels is not independent evidence unless the withheld records and decisive upstream empirical information are independent. If no valid $\mathcal{M}_i$ is available in the current source audit, report **SOURCE-TRACE / OPERATIONAL-MAP NOT CERTIFIED**

Table 5: Priority order for held-out tests, conditional on a traceable forward observation map. These are prospective targets, not claimed completed numerical forecasts.

Rank	Pre-fixed inherited input	Reserved discrimination
1	Electron/positron face and signed-rate symmetry; native environmental owner	Controlled matched e^+e^+ versus e^-e^- relative-response profiles. Primary author's directional prediction: weaker effective positron repulsion; no invented numerical threshold.
2	$w_{L3}/w_{L1} = 4\pi - 1$ and factorized K identities	If one common detector map is fixed independently, predict withheld relative channel responses with no separate K_{ep} or K_{pp} fit; reject the bridge if the model cannot recover the measured channel.
3	H1 integer-winding and capacity rules, fixed before target selection	With an independently declared map, predict a withheld H1/atomic spectral or phase observable rather than use the same measured line to define the parameters.
4	Same locked Core packet under domain-specific measured initial data	Pair-rich stellar output or cosmic seed abundance and baryonic composition, compared blind to conventional transport/BBN/CMB controls.

and seek the exact CURRENT record before opening a new scientific bridge. The original Lake analogy and 101-ring toy are neither six additional parameters nor six independent confirmations.

16 Prospective falsification and research gates

Table 6: Prerequisites and proposed discriminators. None is presently reported as passed.

Gate	Missing derivation	Observable requirement	Failure / stop condition
G0	Native normal/environment-to-motion map	Pre-stated e^+e^+ vs. e^-e^- test after environmental controls	Unmeasured or merely assigned difference
G1	Segregation and rotation dynamics	Predicted spatial/phase profiles, fixed coefficients, appropriate controls	No distinct prediction from standard plasma
G2	Net accumulation and charge ledger	Calculated growth in selected domain; measured charge readout	No physical growth or incompatible measured charge
G3	Sink-to-causal-geometry mapping	Predicted observer-owned causal boundary and seed distribution	No one-way boundary under the specified law
G4	Pre-horizon filtering generator	Measured outgoing particle identity, charge, energy and baryon ledger	Output merely assigned a "proton" label
G5	Cosmological propagation	CMB, BBN, η, PBH abundance, photon background	Conflict with independent observational constraints
G6	Stellar source and observer charge map	Pair injection, core growth, measured Q/M and particle readout	No viable source, incompatible charge or no distinct particle origin
G7	Common mass/readout bridge	Same observer/frame function for electron and candidate proton, calibrated SI response	Substituting construction energy or toy phase into mass without a derived map

Near-term priority. The first scientifically useful result need not be a full primordial black-hole model. It would be a *target-independent environmental-versus-intrinsic pair-response discriminator*, derived from stated Zero Theory assumptions and compared against independent positron/electron observations, with no target leakage. Without G0 and G1, simulating G3 or G4 risks merely programming the desired cosmic ending.

17 Discussion: what would make several answers count as one explanation?

The author's motivating intuition is that revisiting one deep premise could make several formerly disconnected phenomena parts of one explanation. This revision treats that *single-mechanism aspiration* as the principal thesis and as a stronger burden of proof, not as an achieved discovery. The author-proposed stellar extension makes the test even stronger: the same law must work with different measured environmental conditions and must not infer proton production from ordinary stellar-wind protons. It is a legitimate heuristic. It is not a shortcut around empirical consequences. In particular, electron–positron creation from electromagnetic energy is supported; an early pair-rich epoch and noninstantaneous positron survival are established inputs; positron-driven compact-center or horizon formation by the proposed process is not yet derived; and a pre-horizon electron-to-proton remnant is a new process that bears a very substantial conservation and energy burden.

The CURRENT quantitative core already prohibits several independent hand-picked signs or relative coefficients (Section 5.2). Its geometric capacities and factorized pairwise relative-response structure should be treated as inherited constraints, not as six adjustable explanatory choices. The next test is whether those *fixed* inputs generate distinct observable predictions across domains through explicitly named physical maps. The present numerical demonstrations do not yet meet this standard: the lake simulation injects planar swirl; the original filter rejects the input; and the later 101-ring simulation injects the accepted gate, energy allocation and envelope reversal. Those negative audit results are scientifically useful because they isolate exactly where a future model must do real work.

18 Conclusion

The paper preserves a specific Zero Theory causal intuition rather than asking a standard electrical-charge sign to stand in for it. Electron and positron are distinguished in the author's four-layer geometry by opposite face ownership and by outward versus inward observer-related spacetime-normal contributions. Equal-and-opposite creation/withdrawal rates follow conditionally from the declared symmetry assumptions; they do not by themselves establish a force or a metric. In the author's fountain-and-vortex lake, observed separation of two vortices can have an environmental cause. The author proposes the *prospective*, as-yet-unquantified prediction that effective same-species positron repulsion will be substantially weaker than the electron comparator in deliberately matched and controlled circumstances, without asserting positron attraction. A proposed inward flow of observer-accessible space and time toward a dense sink offers a candidate causal interpretation for a one-way black-hole-like boundary, but no event-horizon metric has yet been derived from the underlying field equations.

The wider programme preserves its source-traced, quantitatively constrained conditional architecture and its two-stage exploration of compact seed formation and exterior electron-like to proton-like structural filtering, with a separate application question for pair-rich stellar interiors. Existing exact geometric identities, genuine numerical negative results, observed pair creation and survival, energetic-input and observer-mass distinction, measured external particle properties, and all relevant conservation/evidence audits are maintained with their correct statuses. The Einstein–Maxwell extremality calculation is only a conditional alternative-model benchmark with explicit assumptions and is not offered as an automatic prohibition within Zero Theory. Neither a physical proton conversion nor a primordial positron black hole has been established by this edition. Progress means transporting the existing mathematically locked capacities, phase and relative-response relations through specified observational mappings and then testing predictions frozen before independent measurements. A missing source trace must be investigated as possible canonical maintenance before it is called a scientific open bridge; the author's existing ontology and resolved Core algebra must not be overwritten.

Authorship and review rule. This v0.6 file is a review draft prepared from the author's current explanations and cited project sources. It is not a silent change to the accepted v0.4 source, and it is not a canonical scientific release. All future substantive changes to author-approved passages require a disclosed explanation in Persian and explicit author approval before incorporation into a designated final paper.

A Paper development outline and non-repetition register

This paper is intended as the full first draft of the proposed article. The project handoff for continuation is:

1. **Existing empirical anchors**: pair-production observations, thermal pair cosmology, positron-plasma potentials and compression, PBH constraints and CMB/BBN bounds.
2. **Author hypotheses**: outward electron / inward positron normal presentation; hypothesized selective primordial compaction; black-hole exterior as a possible structural filter; proton-like outgoing product.
3. **Known negative diagnostics**: source–sink-only analogue spreads; sink compaction requires imposed planar circulation; reversing circulation reverses handedness; original filter rejects its default electron; fitted rotating-wall surrogate does not identify internal force sign.
4. **Prohibited promotions**: source/sink coefficient q is not positron charge; in-plane γ is not a spacetime-normal sign; a cluster is not a horizon; a new Python object is not a proton; energy fit is not an independent prediction.
5. **Scoped future tests**: preserve existing CURRENT resolution states; verify an exact Core-to-observable dependency path before declaring missing science; test observer-owned pair response, physical collapse, complete prod-

uct ledgers and blind cosmological predictions where the currently examined sources have not certified a completed operational forecast.

6. **v0.2 revision**: the user-author emphasized several cosmic problems as possible outputs of *one* mechanism; research framing, not derivation.
7. **v0.3 author-supplied extension**: the exact Appendix A v0.1 introduces stellar pair sources, conjectural positron-core formation, and proposed new proton-like stellar output; claim floor/ceiling preserved. Additional conditional RN Q/M check is a standard Einstein–Maxwell comparator, not Zero Theory dynamics. None is a canonical Core update.
8. **v0.4 energetic-source correction**: signed Appendix A v0.2 and its exact integration ZIP distinguish energetic electron-side construction, accessible channel and detector-readout mass; preserve the original rejecting filter versus the later accepting 101-ring toy, numerical ratios versus four-layer additive differences, and the project's CURRENT proton-L3 interface bridge. The original informal nickname is registered as historical provenance, not the publication title.
9. **v0.5 author-preserved mechanism**: C20 face ownership; C21 separation of field readout and interaction; C09.16.5 opposite signed increments; environmental lake intuition; prospective weaker effective positron repulsion; and inward-flow interpretation of a possible causal boundary. Numerical force magnitude, physical metric and proton production remain open.
10. **v0.6 quantitative-lock reconciliation**: CURRENT R2C15 capacities, arrival/event separation, partially resolved 2830 construction, resolved arithmetic remainder, factorized $ee/ep/pp$ relative-coefficient identity and conditional H1 phase closure are explicitly reused, with source IDs and resolution states. No numerical count remainder is promoted to physical residual tension; neither a six-stage free-parameter burden nor a six-stage observational closure is asserted. A rank-ordered frozen hold-out protocol is supplied. The complete Atlas-wide cross-stage map has not been independently certified within this manuscript audit.
11. **Black-hole observational guardrail**: EHT images and observed jets are comparators, not event-level observations of electron-to-proton conversion. The new author supplement contains no new telescope data. These manuscript changes do not modify the Canonical Core or resolve its active bridges.

The original metaphor and author-supplied implementation are preserved as historical source, not rewritten into an alleged first-principles derivation. The available R2-C15 scientific core is treated as a scoped research snapshot, not automatically as an installed and validated release.

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