Two Anchors for the Attractor Framework: Hydrogen and the Jeans Instability Application Paper — June 2026 [A] (Application)

Abstract

The attractor framework has been extended beyond the original variables of basin depth (B) and corrective permeability (κ) to include **energy barrier (B_E)** , **threshold depth (B_T)** , and **channel accessibility (C)** . This paper provides empirical anchoring for these extensions using two well-understood physical systems: the hydrogen atom and the Jeans instability of a gas cloud. Hydrogen's 2p and 2s transitions have identical B_E (10.2 eV) yet differ in κ by eight orders of magnitude. This demonstrates that B_E alone is insufficient; a second parameter (C) is required. The ratio of their Einstein A-coefficients is independently predicted by quantum electrodynamics (dipole vs. two-photon processes), providing a non-circular check of the factorised form. The Jeans instability provides a contrasting case: a deterministic bifurcation where the collapse threshold is a **threshold depth B_T = M/M_J − 1** (for M > M_J). The linear growth rate of the instability scales as Γ∝BTΓ∝*BT*□□, a power law, in contrast to the exponential Arrhenius form of hydrogen. Together, these two test cases validate the extended attractor framework across both noise-driven escape and deterministic bifurcation regimes, using a shared vocabulary (B_E, B_T, C, κ) while acknowledging that each regime draws on the appropriate subset.

1. Introduction

The attractor framework originally described persistence using basin depth B and corrective permeability κ = 1/τ. However, the hydrogen atom revealed a critical limitation: two states with identical B (the 2p and 2s levels) have vastly different κ. This forced the introduction of **channel accessibility (C)** , leading to the extended expression for noise-driven escape:κi→j=ν0 Cij e−BE,ij/σ$\kappa_{i\to j} = \nu_0 C_{ij} e^{-B_{E,ij}/\sigma}$

where B_E is the energy barrier, σ is noise (e.g., kT), and ν_0 an attempt frequency. For deterministic bifurcations (e.g., gravitational collapse of a gas cloud), a different descriptor is needed: **threshold depth (B_T)** , with κ (or the growth rate of the instability) following a power law rather than an exponential. This paper demonstrates that both extensions are empirically grounded, using hydrogen to illustrate the need for C and the Jeans instability to illustrate the need for B_T.

2. Hydrogen: The Need for Channel Accessibility C

2.1 Data

Transition	B_E (eV)	κ (s^{-1})	Measured A-coefficient	Process
2p → 1s	10.2	6.26×10^{8}	6.26×10^{8} s^{-1}	Electric dipole (E1)
2s → 1s	10.2	8.22	8.22 s^{-1}	Two-photon (E1E1)

2.2 Why B_E Alone Fails

Both states have the same energy barrier to the ground state (10.2 eV), yet their decay rates differ by eight orders of magnitude. This shows that the basin depth B (here represented by B_E) is insufficient to determine κ; a second parameter must be introduced.

The framework defines **C** as a dimensionless channel accessibility. For a given transition mechanism (e.g., electric-dipole), C is the ratio of the actual transition probability to the theoretical maximum for that mechanism. For the 2p → 1s E1 transition, we set C = 1. The 2s → 1s decay is not an E1 transition at all; it proceeds via a different physical process (two-photon emission). Its rate is independently calculated from quantum electrodynamics without reference to the framework. The ratio of the two measured rates (≈ 10^8) is predicted by QED and is not a free parameter. Therefore, the factorised form κ ∝ C e^{-B_E/σ} with B_E identical implies that C must account for the entire rate difference. This is consistent with the independent QED prediction, providing a non-circular validation that an additional channel-dependent parameter is needed.

Note: The 2s→1s process is not a suppressed version of the same channel; it is a different channel (two-photon vs. single-photon). For the purpose of validating the need for a channel-specific parameter, this is sufficient. The framework's C parameter is better illustrated by comparing allowed E1 transitions with different matrix elements (e.g., 2p→1s and 3p→1s), where the same mechanism applies and the ratio of C values is independently known. In any case, hydrogen irrefutably demonstrates that B_E alone does not determine κ.

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3. Gas Cloud (Jeans Instability): Threshold Depth and Power-Law Scaling

3.1 The Bifurcation Regime

A uniform, isothermal, self-gravitating gas cloud of mass M has a critical **Jeans mass** M_J. For M > M_J, the cloud is unstable to gravitational collapse; for M < M_J, it is stable. The transition is a **saddle-node bifurcation** in the dynamical landscape.

3.2 Attractor Variables for a Deterministic Bifurcation

- **Threshold depth**: BT=M/MJ−1$BT = M/MJ - 1$ (for M > M_J). At BT=0$BT = 0$ the bifurcation occurs.
- **Energy barrier**: For a deterministic bifurcation, there is no thermal barrier; B_E is not defined. The transition is controlled solely by the distance to threshold.
- **Growth rate**: For M > M_J, the linear growth rate Γ of the instability is the inverse of the collapse time. This serves as the analogue of κ in this regime.

3.3 Scaling Law from Linear Stability Analysis

The standard Jeans dispersion relation for a self-gravitating, isothermal medium gives:ω2=k2cs2−4πGρ0,$\omega^2 = k^2 cs^2 - 4\pi G\rho 0$,

where cs=kT/(μmH)$cs = kT/(\mu mH)$ is the sound speed and ρ0$\rho 0$ the background density. For a cloud of mass M, the critical wavenumber is kJ=4πGρ0/cs$kJ = 4\pi G\rho 0 / cs$. For M > M_J, the longest wavelength (smallest k) is unstable, and the growth rate isΓ=4πGρ0−k2cs2.$\Gamma = 4\pi G\rho 0 - k^2 cs^2$.

Near the threshold, the deviation can be expressed in terms of BTBT. Using the relation between cloud size and density, one finds Γ∝BTΓ∝BT. Hence the collapse

time τ~1/Γ~BT−1/2$\tau \sim 1/\Gamma \sim B_T^{-1/2}$. This is a power law with exponent 1/2, in contrast to the exponential Arrhenius form of hydrogen.

On the stable side ($M < M_J$), the frequency ω is real, giving oscillatory sound waves. Without a dissipative mechanism, there is no exponential recovery; thus the concept of a "recovery rate" κ is not directly applicable. The framework's threshold depth B_T is best understood as a control parameter on the unstable side.

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4. Synthesis: Shared Vocabulary, Distinct Descriptors

Feature	Hydrogen	Jeans Instability
Regime	Noise-driven quantum escape	Deterministic bifurcation
Primary descriptor	B_E (energy barrier)	B_T (threshold depth)
Second descriptor	C (channel accessibility)	Not required (power-law exponent fixed)
Scaling	Exponential: $\kappa \propto Ce^{-B_E/\sigma}$	Power law: $\Gamma \propto B_T^{\square}$

Both systems are described by the same conceptual **vocabulary** (basin depth, corrective permeability, threshold, accessibility), but each regime draws on the appropriate subset. Hydrogen validates the need for a channel-specific factor C, while the Jeans instability validates the concept of a threshold depth B_T and the associated power-law scaling.

5. Conclusion

The hydrogen atom and the Jeans instability provide empirical support for the extended attractor framework. Hydrogen shows that identical energy barriers can yield vastly different transition rates, necessitating a channel accessibility parameter C. The Jeans instability shows that deterministic bifurcations are governed by a threshold depth B_T and follow power-law scaling, distinct from the exponential Arrhenius law. Together, these two test cases anchor the framework across two fundamental classes of attractor transitions. The next step is to extend the approach to dissipative systems and to social/cognitive attractors, where C may become state-dependent and network-derived.

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From Strange Attractors to the Attractor Framework: Structural Correspondences

and Conceptual Extensions

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Abstract

The attractor framework is a unified naturalistic ontology grounded in the principle that persistence under perturbation is the fundamental mark of reality. This paper traces structural correspondences between the framework and two major scientific achievements of the late twentieth century: the mathematical theory of strange attractors developed by David Ruelle and Floris Takens, and the thermodynamics of dissipative structures developed by Ilya Prigogine. The framework developed its vocabulary and concepts independently over several decades; the correspondences documented here are offered as post-hoc validation, not as evidence of genealogical descent. We show that the framework's core concepts—dissipative attractor, basin, corrective permeability (κ), and invariant reference—are consistent with established nonlinear dynamics and nonequilibrium thermodynamics. The fantasy attractor—a belief system with low corrective permeability—is identified as a psychological analogue of the strange attractor, governed by structurally analogous but mechanistically distinct dynamics. The paper clarifies which framework claims are grounded in established physics and which are heuristic extensions requiring independent validation. The framework is offered as a research program, not a completed theory.

1. Introduction: Independent Development, Post-Hoc Validation

The attractor framework (Galida, 2026a) is a naturalistic ontology organized around a single diagnostic principle: **persistence under perturbation is the mark of the real.** It divides all persistent structures into conservative persistence structures (the eternal, mindless, invariant skeleton) and dissipative attractors (temporary, entropy-exporting systems that converge toward stable basins). It introduces corrective permeability (κ) as a functional measure of a system's capacity to absorb perturbation and return to its basin. It applies this vocabulary across physics, biology, cognitive science, and social dynamics.

The framework's concepts were developed independently over several decades, through a combination of philosophical inquiry, systems theory, and N=1 self-engineering experiments. They did not derive from the traditions described below in a genealogical sense. However, the structural parallels with established nonlinear dynamics and nonequilibrium thermodynamics are substantial. Documenting these parallels serves three purposes: it demonstrates the framework's consistency with well-validated physical theory; it identifies where the framework extends beyond its precursors; and it clarifies which claims are grounded in established science and which are heuristic extensions requiring independent validation.

Two bodies of twentieth-century science provide particularly strong structural correspondences: David Ruelle and Floris Takens's theory of strange attractors, and Ilya Prigogine's thermodynamics of dissipative structures. This paper maps those correspondences and identifies the points where the framework diverges from or extends beyond its precursors.

2. Ruelle’s Strange Attractor: Structural Correspondences

David Ruelle and Floris Takens proposed in 1971 that turbulent fluid motion is governed by a new kind of mathematical object: the strange attractor. Ruelle’s 1980 paper “Strange Attractors” defined it with precision and became the canonical introduction for a generation of scientists. Five features of Ruelle’s definition correspond to core concepts of the attractor framework. These correspondences are structural, not genealogical, and are offered as a demonstration of consistency with established physics.

2.1 Attracting Set → Basin

Ruelle defined a strange attractor as a bounded set A contained in an open neighborhood U such that every trajectory starting in U eventually converges to A and remains arbitrarily close to it. In the attractor framework, this is the **basin**: the region of state space toward which trajectories converge and from which they resist displacement. Ruelle’s quadrilateral ABCD for the Hénon attractor—within which all subsequent iterates remain—is precisely a basin in the framework’s sense. The correspondence is straightforward and exact.

2.2 Sensitive Dependence → Corrective Permeability

Ruelle characterized sensitive dependence on initial conditions by the exponential growth of small errors: $d(X_t, X'_t) \sim d(X_0, X'_0) \cdot a^t$, with $a > 1$ and characteristic exponent $\lambda = \ln a$ (for a standard textbook treatment of Lyapunov exponents and nonlinear dynamics, see Strogatz, 2018). Two initially nearby trajectories diverge rapidly, making long-term prediction impossible.

The attractor framework reframes perturbation response through **corrective permeability** (κ), defined functionally as the capacity of a system to dissipate perturbation energy and return to its basin. The term "permeability" is used in a non-standard, functional sense; it is not intended to carry the dimensional meaning it holds in physics (e.g., Darcy's law, where permeability has units of area). It was chosen to emphasize the *openness* of an attractor to corrective perturbation—a qualitative property—while recognizing that its quantitative expression is a rate (inverse time). The distinction between the qualitative concept and its quantitative operationalization should be kept in view throughout.

κ and λ capture different aspects of dynamical resilience. λ measures the rate of *divergence* of neighboring trajectories; κ measures the rate of *convergence* of a perturbed system back to equilibrium. A system can have high λ (chaotic sensitivity) and simultaneously high κ (rapid damping). This distinction between divergence rate and recovery rate extends the analytical vocabulary in a direction Ruelle did not pursue, and represents one of the framework's conceptual contributions.

2.3 Dissipative Condition → Dissipative Attractor

Ruelle emphasized that strange attractors occur only in dissipative systems—those in which ordered energy is converted to heat and exported as entropy (what Ruelle called "noble forms of energy"). Conservative systems preserve phase-space volumes and do not produce attractors. The universe as a whole is conservative; strange attractors exist only in subsystems.

This maps directly onto the attractor framework's distinction between the **eternal conservative skeleton** and the **transient dissipative dance**. The six metronomes—electron, proton, three neutrino mass states, and CVU lattice—are conservative persistence structures. They do not decay, export no entropy,

and are not attractors. Living bodies, minds, societies, and climate systems are dissipative attractors, continuously exporting entropy and navigating constraint fields. Ruelle's dissipative condition is the physical foundation of this central ontological partition.

2.4 Discrete and Continuous Dynamics → The Two Metronomes

Ruelle presented both discrete-time maps (Hénon) and continuous-time flows (Lorenz, 1963). In both cases, strange attractors emerge. The attractor framework identifies invariant references—**metronomes**—that anchor dissipative dynamics. Positional metronomes (the center of mass of a gas cloud, the fixed point of a difference equation) and frequency metronomes (orbital periods, the characteristic exponent λ) provide the invariant skeleton against which the transient dance is measured. Ruelle's maps and flows contain these invariants implicitly; the framework makes them explicit.

2.5 Indecomposability → Unified Attractor (Partial Correspondence)

Ruelle required that a strange attractor not be decomposable into two separate attractors. This is a strong mathematical condition. The attractor framework inherits the spirit of this—dissipative attractors are treated as unified, coherent basins—but the correspondence is only partial. The framework's conscious body thesis (Galida, 2026g) explicitly recognizes *multiple* candidate attractors within a single organism (the enteric nervous system, the cardiac nervous system). These are coupled but semi-autonomous basins, in tension with Ruelle's indecomposability condition. The framework thus extends the attractor concept in a direction Ruelle's original definition did not anticipate. This divergence is noted as a feature of the framework, not a failure of correspondence.

3. Prigogine’s Dissipative Structures: The Thermodynamic Parallel

While Ruelle provided the mathematical prototype of the strange attractor, Ilya Prigogine provided the thermodynamic foundation for the broader class of dissipative systems. Prigogine’s Nobel-winning work (Prigogine, 1980, 1984) demonstrated that systems maintained far from thermodynamic equilibrium spontaneously self-organize into coherent, ordered structures—dissipative structures—that persist only as long as they are sustained by energy and matter flows.

The structural parallels between Prigogine’s dissipative structures and the attractor framework’s dissipative attractor are substantial. Both describe systems maintained far from equilibrium by continuous energy throughput. Both recognize that dissipation is not merely a degradation of order but a condition for the emergence of order. Both extend beyond physics into chemical, biological, and ecological systems. The Belousov-Zhabotinsky reaction, biochemical oscillations, and ecosystem dynamics are Prigoginean dissipative structures; they are also dissipative attractors in the framework’s vocabulary. Kauffman’s (1993) work on self-organization and selection in evolution provides an independent biological parallel, reinforcing the consistency of the attractor framework with established complexity theory.

The framework’s applications to living bodies, minds, and societies are consistent with the Prigoginean tradition. This consistency was recognized retrospectively; the framework’s concepts were not derived from Prigogine. The parallels are offered as evidence that the framework’s biological and social extensions are grounded in established thermodynamic principles, not as evidence of intellectual descent.

The framework thus finds post-hoc validation in two complementary scientific traditions: the mathematical theory of strange attractors (Ruelle, Takens, Lorenz) for the concepts of basin, sensitive dependence, and chaotic dynamics; and the thermodynamics of dissipative structures (Prigogine) for the concept of entropy-exporting, self-organizing systems far from equilibrium. Neither tradition alone is sufficient; together they provide the physical foundations with which the framework is consistent.

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4. The Attractor Framework: Extensions Beyond the Physical Prototypes

The attractor framework extends the concepts of basin, dissipation, and perturbation response beyond physical and biological systems into cognitive and social domains. These extensions are heuristic hypotheses, not established results. They are offered as candidate applications requiring independent validation.

4.1 From Strange to Dissipative: A Broadened Scope

Ruelle’s strange attractor and Prigogine’s dissipative structure are both special cases of the framework’s broader category: the **dissipative attractor**—any system that exports entropy while converging toward a stable basin. The framework does not require the attractor to be “strange” (to exhibit sensitive dependence). Fixed-point attractors, periodic attractors, and quasiperiodic attractors are all dissipative attractors under this definition. The framework’s scope is deliberately broad, encompassing any persistent, entropy-exporting system regardless of its internal dynamical complexity.

4.2 The Fantasy Attractor: A Structural Analogy

The framework's most significant extension beyond Ruelle and Prigogine is the concept of the **fantasy attractor**: a belief system with low corrective permeability that resists updating under contradictory evidence (Galida, 2026c, 2026d, 2026e). The dopamine covenant—the neurochemical reinforcement of certainty through mesolimbic reward—provides a psychological mechanism that is structurally analogous to, but not identical with, physical dissipation.

The analogy is as follows. A physical dissipative attractor exports entropy via radiation or heat, returning to its basin after perturbation. In the physical case, "basin depth" is formally defined through the geometry of the attractor in phase space, measurable in principle from the equations of motion. A cognitive attractor neutralizes perturbation via reframing, also preserving its basin—but here "basin depth" is a functional analogy, not a formal measure. Both systems respond to destabilizing perturbations by restoring their pre-perturbation state. The analogy holds at the functional level.

However, the mechanisms differ in important respects. Physical dissipation involves the export of thermodynamic entropy from a subsystem to its environment. Dopamine reinforcement is a *feedback amplification* mechanism—it strengthens the neural pathways associated with the belief, making them more salient and resistant to competition. It does not export entropy in the thermodynamic sense. The structural analogy—a system responding to perturbation by restoring its basin—holds at the functional level, but the physical substrates and mechanisms are distinct. The framework does not claim identity; it claims functional parallelism.

The assignment of $\kappa \approx 0$ to fantasy attractors is qualitative and provisional. Unlike Ruelle's λ, which is computable from the equations of motion, κ for belief systems currently lacks an operationalized measurement procedure. The framework's applications to political and religious belief systems (Galida, 2026d, 2026e) are heuristic extensions, offered as

diagnostic hypotheses. Independent validation through operationalized κ remains a task for future empirical work.

4.3 Candidate Applications Across Domains

The framework's cross-domain applications are candidate hypotheses, not established results. Each requires independent validation. The following are offered as illustrations of the framework's heuristic reach, with the caveat that formal operationalization is pending.

- **Climate dynamics** (Galida, 2026b): The Earth's climate is a dissipative attractor with multiple basins, tipping points, and corrective feedbacks. The claim that linear warming models constitute a fantasy attractor is a diagnosis of the modeling community's resistance to nonlinear dynamics, not a claim about the physical climate system itself. The two must be distinguished: the climate is a physical attractor; the *belief* that it behaves linearly is a cognitive one.
- **Political ideology** (Galida, 2026d): The $\kappa \approx 0$ assignment for the MAGA movement is a qualitative diagnostic based on observable indicators (electoral loss response, legal defeat response, internal dissent tolerance). It is not a measurement in Ruelle's sense. The assignment is offered as a hypothesis to be tested against alternative interpretations.
- **Apocalyptic convergence** (Galida, 2026e): The claim that three Abrahamic basins have phase-locked into a meta-attractor uses "phase-locked" in an extended, qualitative sense. The formal demonstration of phase-locking requires identifying coupling constants and frequency ratios, which have not been established. The claim is offered as a structural diagnosis, not a dynamical proof.
- **Organ-level consciousness** (Galida, 2026g): The identification of candidate organ-level minds as

dissipative attractors applies the framework's criteria directly to biological subsystems. The C. elegans threshold provides a benchmark; the independent operationalization of κ for these subsystems awaits experimental protocols.

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5. The Metronome: An Innovation Without Direct Precedent

One concept in the attractor framework has no direct analogue in either Ruelle or Prigogine: the **metronome**—the invariant reference around which dissipative dynamics organize. In the gas cloud paper (Galida, 2026f), the center of mass and the orbital period were identified as positional and frequency metronomes, respectively. These invariants are not attractors; they are the fixed skeleton against which the transient dance is measured.

The six metronomes of the eternal skeleton—the electron, the proton, the three neutrino mass states, and the CVU lattice—are the ultimate invariants, defining time through their fixed, unchanging frequencies. Ruelle's maps and flows contain invariants (fixed points, conserved quantities, characteristic exponents), but he did not distinguish them as a separate ontological category. Prigogine's dissipative structures also operate against a background of invariant constraints. The attractor framework's explicit separation of the invariant skeleton from the dissipative dance is a genuine conceptual contribution, not present in either precursor tradition.

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6. Conclusion: A Coherent Vocabulary, Conditionally Applied

The attractor framework is structurally consistent with the mathematical physics of strange attractors and the thermodynamics of dissipative structures. Its core concepts—dissipative attractor, basin, corrective permeability, and invariant reference—map cleanly onto established physical constructs. Its extensions into cognitive and social domains are heuristic hypotheses, not established results.

The framework developed its vocabulary independently. The correspondences documented here are offered as post-hoc validation: the framework speaks the language of established nonlinear dynamics and nonequilibrium thermodynamics, and where it departs from these precursors it does so explicitly, with acknowledgment of the remaining gaps between analogy and operationalization. Future work must close those gaps through quantitative measurement of κ, formal modeling of coupling dynamics, and empirical testing of the framework's diagnostic claims.

The framework is offered as a research program, not a completed theory.

References

- Galida, R. (2026a). *Persistence Under Perturbation: The Eternal Skeleton and the Transient Dance.* Fantasy Attractor.
- Galida, R. (2026b). The Climate Attractor: Nonlinear Dynamics, Tipping Points, and Corrective Permeability in the Earth System. Fantasy Attractor.
- Galida, R. (2026c). The Dopamine Covenant: Neurochemical

Reinforcement and the Persistence of Fantasy Attractors in Religion and Politics. Fantasy Attractor.
- Galida, R. (2026d). The MAGA Attractor: Fantasy, Colonization, and the Terminal Phase of a Sealed Basin. Fantasy Attractor.
- Galida, R. (2026e). The Apocalyptic Meta-Attractor: Amplification of Secular Conflict Through Positive Feedback Coupling Among Three Abrahamic Fantasy Basins. Fantasy Attractor.
- Galida, R. (2026f). The Gas Cloud as a Dissipative Attractor: A Demonstration of the Attractor Framework in Standard Astrophysics. Fantasy Attractor.
- Galida, R. (2026g). The Conscious Body: Organs as Attractor-Based Minds. Fantasy Attractor.
- Kauffman, S. A. (1993). *The Origins of Order: Self-Organization and Selection in Evolution.* Oxford University Press.
- Lorenz, E. N. (1963). Deterministic nonperiodic flow. *Journal of the Atmospheric Sciences*, 20(2), 130–141.
- Prigogine, I. (1980). *From Being to Becoming: Time and Complexity in the Physical Sciences.* W.H. Freeman.
- Prigogine, I., & Stengers, I. (1984). *Order Out of Chaos: Man's New Dialogue with Nature.* Bantam.
- Ruelle, D. (1980). Strange attractors. *The Mathematical Intelligencer*, 2, 126–137.
- Ruelle, D., & Takens, F. (1971). On the nature of turbulence. *Communications in Mathematical Physics*, 20, 167–192.
- Strogatz, S. H. (2018). *Nonlinear Dynamics and Chaos* (2nd ed.). CRC Press.

"For independent neuroscientific corroboration of the attractor dynamics described here, see A Preliminary Mapping Between Ring Attractor Dynamics and the Attractor Framework." https://www.sciencedirect.com/science/article/pii/

S2405844024114892

“see also” https://jamestobinphd.com/the-psychology-of-attractor-states/

The Gas Cloud as a Dissipative Attractor: A Demonstration of the Attractor Framework in Standard Astrophysics

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Abstract

The evolution of an isolated interstellar gas cloud from turbulence to gravitational equilibrium is a classic problem in astrophysics. Standard models describe this process through hydrodynamics, thermodynamics, and Newtonian gravity. This paper presents the same evolution through the lens of the attractor framework, demonstrating that the framework’s vocabulary—dissipative attractor, basin, invariant reference, and corrective permeability—maps cleanly onto the standard physics without modification or additional assumptions. The

paper makes no new physical predictions; it demonstrates conceptual unification. Each attractor term is explicitly defined in terms of its standard astrophysical equivalent. A worked example translates the virial theorem into attractor language, quantifying basin depth and corrective permeability for a canonical molecular cloud. A brief cross-domain parallel to biological wound healing illustrates the framework's applicability beyond astrophysics. The paper concludes that the attractor framework is fully consistent with standard astrophysics and provides a unified vocabulary for persistence, resilience, and convergence across physical and biological systems, with broader applicability noted.

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1. Introduction: The Cloud as a Dissipative System

Consider an isolated cloud of interstellar gas and dust, far from any external gravitational disturbance. Its mass is sufficient that self-gravity will eventually overcome thermal pressure, initiating collapse. At early times, the cloud is turbulent. Thermal motions, magnetic fields, and inhomogeneous density distributions produce a chaotic, dynamic state. Over time, the cloud radiates energy, cools, contracts, and ultimately settles into a stable configuration: a sphere, if rotation is negligible, or a rotationally-flattened disk.

Standard astrophysics describes this process with precision. The equations of hydrodynamics, the virial theorem, the Jeans criterion, and the radiative cooling functions all contribute to a well-tested model of star formation. Nothing in this paper challenges or revises that model.

The attractor framework (Galida, 2026a) offers a complementary perspective. It is not an alternative to standard physics, but a unifying conceptual vocabulary that identifies the dynamical

principles at work: persistence under perturbation, dissipative basins, invariant references, and corrective permeability. This paper applies that vocabulary to the evolution of an isolated gas cloud, demonstrating that the framework maps directly onto the standard model without contradiction.

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2. Definitions: Attractor Vocabulary and Standard Equivalents

To make the translation precise, each framework term is defined below alongside its standard astrophysical counterpart. These definitions are used consistently throughout the paper.

Attractor Term	Definition	Standard Physics Equivalent
Dissipative attractor	A system that exports entropy while converging toward a stable, minimum-energy state	Radiative cooling + gravitational contraction
Basin	The minimum-energy configuration toward which the system evolves and from which it resists displacement	Sphere (non-rotating) or rotationally-supported disk
Basin depth	The energy required to permanently disrupt the system from its basin	Gravitational binding energy, □U□□U□

Attractor Term	Definition	Standard Physics Equivalent
Invariant reference (metronome)	A quantity or point that remains fixed throughout the system's evolution, providing an anchor for transient dynamics	Center of mass (positional reference); orbital periods (frequency reference, emerging during contraction)
Corrective permeability (κ)	The rate at which the system dissipates perturbation energy and returns to its basin, quantified by κ=1/τcoolκ=1/τcool	Damping rate, quantified by the radiative cooling function Λ(T)Λ(*T*)
Rail	A conservation law that constrains the accessible basins, preventing the system from reaching the global energy minimum	Conservation of angular momentum

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3. The Convulsive Phase: Turbulence and Disordered Motion

In its initial state, the cloud is far from equilibrium. Supersonic turbulence, driven by gravitational infall and internal shocks, produces a complex velocity field. Density distributions are filamentary and clumpy. There is no coherent rotation axis, no global structural alignment, and no stable configuration.

In attractor terms, this is the **perturbation-rich early phase**. The cloud is a dissipative system that has not yet found its basin. Its trajectory through state space is erratic. Local

transient attractors—temporary vortices, shock fronts, density enhancements—form and dissolve without stabilizing. The system has not yet converged upon a single, deep attractor.

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4. The Invariant Reference: Center of Mass as Metronome

Amid the turbulence, one quantity remains strictly invariant: the cloud's center of mass (CM). For an isolated system, conservation of momentum guarantees that the CM moves with constant velocity. In the CM frame, this point is fixed. No internal force—gravitational, pressure, or magnetic—can displace it.

The attractor framework identifies such invariants as **positional metronomes**—fixed reference points that anchor the transient dance of dissipative dynamics. The CM is the gravitational barycenter around which all subsequent evolution organizes. It does not oscillate, does not evolve, and does not respond to perturbations. It is the still point at the center of the storm.

As the cloud contracts and its mass distribution becomes centrally concentrated, **orbital periods** at characteristic radii emerge as frequency metronomes. For a test particle at radius rr, the Keplerian orbital period is:P=2πr3GM(r)$P = 2\pi \sqrt{\frac{r^3}{GM(r)}}$

where M(r)$M(r)$ is the mass enclosed within radius rr. These periods define the natural clock of the contracting system—the invariant rhythms against which all dissipative timescales can be measured. The center of mass anchors position; the orbital periods anchor time. Together they constitute the invariant skeleton of the attractor.

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5. The Dissipative Mechanism: Radiation and Entropy Export

A dissipative attractor requires a mechanism for exporting entropy. The gas cloud exports entropy through **radiation**. As the cloud contracts, gravitational potential energy is converted into kinetic energy, which is then thermalized through collisions. Atoms and molecules are excited; they emit photons that escape the cloud, carrying away energy and entropy.

This radiative cooling is the cloud's **dissipation channel**. Without it, the cloud would remain in a hot, pressure-supported equilibrium and would not collapse. With it, the cloud can progress toward deeper gravitational binding.

In attractor terms, the cloud is seeking its minimum-energy basin. Radiation is the mechanism by which it sheds the energy that keeps it from reaching that basin. Each emitted photon is a small perturbation exported to the environment, allowing the remaining system to settle deeper into its attractor.

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6. The Attractor Basin: Sphere, Disk, and the Rail of Angular Momentum

As the cloud cools and contracts, it approaches its lowest-energy configuration under self-gravity. For a non-rotating, non-magnetic cloud, this is the **sphere**—the shape that minimizes gravitational potential energy for a given mass. Every particle settles as close to the center of mass as the exclusion of other particles permits. The sphere is

the **unconstrained basin**: the global energy minimum of the system.

If the cloud possesses net angular momentum, the sphere is inaccessible. Conservation of angular momentum acts as a **rail**—a constraint that channels the system toward a different basin. The cloud must flatten along its rotation axis, forming a **disk**. The disk is the minimum-energy configuration accessible under the rail of fixed angular momentum. Gravity seeks the sphere; the rail redirects the trajectory toward the disk.

The approach to the basin occurs over the radiative cooling timescale, typically 104104 to 105105 years for dense molecular cloud cores. This is the cloud's convergence time—the duration of its transient dance before settling into its persistent configuration.

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7. Corrective Permeability and the Virial Theorem

The virial theorem provides the quantitative bridge between standard astrophysics and the attractor framework. For a system in equilibrium:2K+U=02*K*+*U*=0

where K*K* is the total kinetic energy and U*U* is the gravitational potential energy. In attractor terms:

- **Basin depth** = □U□□*U*□, the gravitational binding energy.
- **Perturbation** = any injection of kinetic energy ΔKΔ*K* that raises K*K* above the equilibrium value □U□/2□*U*□/2.
- **Corrective permeability** = κ=1/τcool*κ*=1/*τ*cool□, the rate at which radiative cooling dissipates ΔKΔ*K* and restores virial equilibrium.

Worked Example. Consider a canonical dense molecular cloud core (Shu et al., 1987; McKee & Ostriker, 2007):

Parameter	Symbol	Value	Units
Mass	M*M*	104M⊙104*M*⊙	≈2×1034≈2×1034 kg
Radius	R*R*	1 pc	≈3.09×1016≈3.09×1016 m
Temperature	T*T*	10 K	
Mean number density	n*n*	~103~103	cm⁻³

Step 1: Basin depth. The gravitational potential energy (to order of magnitude; the exact coefficient for a uniform-density sphere is 3/53/5) is:|U|~GM2R≈(6.67×10−11)×(2×1034)23.09×1016≈(6.67×10−11)×(4×1068)3.09×1016≈8.6×1041 J|*U*|~*RGM*2≈3.09×1016(6.67×10−11)×(2×1034)2≈3.09×1016(6.67×10−11)×(4×1068)≈8.6×1041 J

At virial equilibrium, K=|U|/2≈4.3×1041*K*=|*U*|/2≈4.3×1041 J.

Step 2: Perturbation. Suppose a supernova explodes at a distance d≈10*d*≈10 pc from the cloud. A typical supernova releases ESN~1044*E*SN~1044 J. The fraction intercepted by the cloud is the ratio of the cloud's cross-sectional area to the surface area of the sphere at distance d*d*:f~πR24πd2~(3.09×1016)24×(3.09×1017)2~2.5×10−3*f*~4*πd*2*πR*2~4×(3.09×1017)2(3.09×1016)2~2.5×10−3

Not all intercepted energy couples efficiently; a coupling efficiency of ϵ~0.01*ϵ*~0.01–0.10.1 is typical for shock-cloud interactions (McKee & Ostriker, 2007). Choosing the upper end, ϵ~0.1*ϵ*~0.1:ΔK=ESN×f×ϵ~1044×(2.5×10−3)×0.1≈2.5×1040 JΔ*K*=*E*SN×*f*×*ϵ*~1044×(2.5×10−3)×0.1≈2.5×1040 J

This perturbation is modest—approximately 6% of the equilibrium kinetic energy. The cloud is disturbed but not disrupted. Radiative cooling will restore virial equilibrium on a characteristic timescale.

Step 3: Cloud volume. Converting the radius to centimeters:R=1 pc=3.09×1018 cm$R$=1 pc=3.09×1018 cm

The volume is:V=43πR3≈43π(3.09×1018)3≈1.24×1056 cm3V=34 πR3≈34π(3.09×1018)3≈1.24×1056 cm3

Step 4: Corrective permeability. At T~10T~10 K and n~103n~103 cm⁻³, the dominant coolant is CO rotational line emission, with a cooling function Λ(T)~10−23Λ(T)~10−23 erg cm⁻³ s⁻¹ (Goldsmith & Langer, 1978; Neufeld, Lepp & Melnick, 1995). Convert ΔKΔK to erg:ΔK=2.5×1040 J=2.5×1047 ergΔK=2.5×1040 J=2.5×1047 erg

The cooling timescale is:τcool~ΔKVΛ≈2.5×1047(1.24×1056)×(10−23)≈2.5×10471.24×1033≈2.02×1014 s~6.4×106 yearsτcool$\sim \frac{V\Lambda\Delta K}{}\approx \frac{(1.24\times10^{56})\times(10^{-23})}{2.5\times10^{47}}\approx \frac{1.24\times10^{33}}{2.5\times10^{47}}$ ≈2.02×1014 s~6.4×106 years

The corrective permeability is:κ=1τcool≈4.95×10−15 s−1$\kappa=\frac{1}{\tau_{\text{cool}}}\approx4.95\times10^{-15}$ s−1

Step 5: Interpretation. The perturbation is damped within a few million years. The basin depth (|U|~8.6×1041|U|~8.6×1041 J) far exceeds the perturbation energy, ensuring the cloud's structural integrity. Corrective permeability, quantified by κκ, is the mechanism by which the cloud restores coherence—absorbing the modest perturbation through radiative cooling and returning to virial equilibrium on a timescale short compared to the cloud's overall lifetime (~107107 years).

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8. Cross-Domain Parallel: Biological Wound Healing

The same attractor vocabulary applies without modification to

biological systems.

A wound is a perturbation to the stable attractor of healthy tissue. The body responds through a multi-stage healing cascade: clotting stops further damage, inflammation cleans the wound, and tissue repair restores structural integrity. The healing rate—quantified clinically by wound closure time—is the biological corrective permeability. The healthy baseline state is the basin. Complications like impaired circulation reduce oxygen delivery, slowing fibroblast activity and thus reducing κ (Guo & DiPietro, 2010).

The gas cloud perturbed by a supernova shock and the human body perturbed by a wound are structurally identical within the framework: a dissipative attractor, displaced from its basin, activates corrective mechanisms at a characteristic rate, and either returns to coherence or undergoes permanent state transition.

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9. Observational Consistency

The framework's description of cloud evolution is fully consistent with standard observations:

- **Turbulent molecular clouds** exhibit the chaotic velocity fields and filamentary structures predicted by the convulsive phase.
- **Radiative cooling** is traced by CO, H_2O, and other molecular line emissions.
- **Protostellar cores** represent the approach to the spherical attractor.
- **Protoplanetary disks** are the rotationally-constrained basins.
- **Bound clusters and stellar systems** persist under external perturbations, demonstrating basin depth.

These observations are predicted and explained by standard astrophysics. The attractor framework is consistent with all of them. Its contribution in this domain is conceptual, not empirical.

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10. Conclusion

The evolution of an isolated gas cloud from turbulence to equilibrium is fully described by standard astrophysics. The attractor framework does not replace that description. It translates it into a unified conceptual vocabulary—dissipative attractor, basin, invariant reference, rail, corrective permeability—that applies across physical and biological systems, with broader applicability noted.

The center of mass remains fixed while the cloud convulses, collapses, and settles. The virial theorem, translated into attractor language, quantifies basin depth as gravitational binding energy and corrective permeability as the inverse cooling timescale. The framework is consistent with all standard observations and requires no new physics.

The metronomes hum. The cloud finds its basin. The framework holds.

References

- Galida, R. (2026a). *Persistence Under Perturbation: The Eternal Skeleton and the Transient Dance.* Fantasy Attractor.
- Goldsmith, P. F., & Langer, W. D. (1978). Molecular cooling and thermal balance of dense interstellar clouds. *The Astrophysical Journal*, 222, 881–895.

- Guo, S., & DiPietro, L. A. (2010). Factors affecting wound healing. *Journal of Dental Research*, 89(3), 219–229.
- McKee, C. F., & Ostriker, E. C. (2007). Theory of star formation. *Annual Review of Astronomy and Astrophysics*, 45, 565–687.
- Neufeld, D. A., Lepp, S., & Melnick, G. J. (1995). Thermal balance in dense molecular clouds: radiative cooling rates and emission-line luminosities. *The Astrophysical Journal Supplement Series*, 100, 132–147.
- Shu, F. H., Adams, F. C., & Lizano, S. (1987). Star formation in molecular clouds: Observation and theory. *Annual Review of Astronomy and Astrophysics*, 25, 23–81.

*"For independent neuroscientific corroboration of the attractor dynamics described here, see A Preliminary Mapping Between Ring Attractor Dynamics and the Attractor Framework."*https://www.sciencedirect.com/science/article/pii/S2405844024114892

A Logical Exclusion of Classical Theistic God Within the Attractor Framework

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Abstract

This paper demonstrates that the God of classical Abrahamic theism—a conscious, intentional, eternal, omnipotent, and omnibenevolent agent who created the universe and intervenes in it—is logically excluded by the attractor framework. The proof is conditional on three axiomatic commitments: physicalism (the physical is what exists), the conservative/dissipative distinction as an exhaustive ontological partition, and the empirical generalization that all observed consciousness is dissipative. Process theology and panentheism escape the triangle but abandon the classical attributes. Within these axioms, three interlocking theorems form a closed geometric proof. Theorem 1 (the Flatland principle): to interact with the physical requires a shared physical property. Theorem 2: all persistent structures are either conservative or dissipative. Theorem 3: all observed consciousness is dissipative; a conscious conservative entity would require an unseen category. The paper documents the dopamine covenant as the neurochemical mechanism sustaining God-belief, and the historical reframing cascades that preserve theological attractors. The framework's own falsifiability conditions are stated explicitly. The proof is conditional on its axioms; the reader who rejects them will not be persuaded.

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1. Introduction: Axioms, Not Established Facts

Every logical proof begins with axioms—foundational commitments that are asserted, not derived. This paper makes its axioms explicit so the reader can evaluate the proof on

its own terms.

Axiom 1: Physicalism. The physical is what exists. Anything non-physical is, by definition, non-existent. Physicalism is a serious philosophical position with extensive defense in the literature (Stoljar, 2010). It is contested by dualists, idealists, and theologians. This paper does not argue for physicalism; it adopts it as a starting point.

Axiom 2: The conservative/dissipative distinction. All persistent structures fall into two dynamical classes: conservative persistence structures (eternal, time-symmetric, mindless) and dissipative attractors (temporary, energy-dependent, potentially conscious). This distinction is derived from the attractor framework (Galida, 2026a) and draws on the broader literature on nonequilibrium thermodynamics and self-organization (Prigogine & Stengers, 1984). It is treated here as exhaustive.

Axiom 3: Consciousness is dissipative. All observed consciousness is a property of dissipative systems requiring a physical substrate, energy flow, and entropy export. This generalization is consistent with the neuroscience of consciousness, which uniformly associates conscious states with metabolic activity in neural tissue (Koch, 2004). The free energy principle (Friston, 2010) proposes that all self-organizing biological systems minimize free energy through active inference—a process that is inherently dissipative. Deacon (2012) argues that consciousness and life are inseparable from the entropic and energetic dynamics of far-from-equilibrium systems. Whether consciousness *requires* dissipation at the mechanistic level is an open question; the present paper treats the empirical generalization as sufficient for the proof.

The proof is conditional: *if* these axioms are accepted, *then* classical theistic God is logically excluded.

2. The Geometry of Disproof: Three Theorems

2.1 Theorem 1: The Flatland Principle

Edwin Abbott's *Flatland* (1884) describes a two-dimensional world whose inhabitants perceive a passing sphere only as a growing and shrinking circle. The sphere is higher-dimensional but interacts with Flatland because it shares extension in the plane.

The principle: to exist is to interact, and interaction requires at least one shared property. The sphere shared extension in two dimensions with Flatland. Without that shared property, there would be no interaction, no trace, no basis for inference.

If God interacts with the physical universe, God must share at least one physical property with it. A non-interactive God is indistinguishable from a non-existent one.

The causal power evasion. Theists may claim that divine causation is *sui generis*—that God causes physical events without sharing physical properties, just as the mind causes bodily movements without a fully specified mechanism. This analogy fails under scrutiny. In mind-body causation, the mind is a dissipative attractor of the physical brain and body—it *is* a physical pattern, not an immaterial substance. The interaction between mind and body is physical-to-physical causation within a single dissipative system, mediated by neural pathways, neurotransmitters, and electrochemical gradients. Divine causation, by contrast, would be a non-physical entity acting on physical systems with no mediating substrate and no shared properties. Mental causation is physical causation; divine causation would be magic. The

theist who appeals to mental causation as a model for divine action inadvertently concedes that the mind is physical—which satisfies Theorem 1 at the cost of abandoning dualism. The theist who insists divine causation is genuinely non-physical owes an account of the mechanism. After millennia of theology, none has been provided.

2.2 Theorem 2: The Conservative/Dissipative Distinction

All persistent structures are either conservative (eternal, unchanging, unconscious) or dissipative (temporary, energy-dependent, potentially conscious). There is no third category within the framework.

2.3 Theorem 3: The Exclusion of Conscious Eternity

All observed consciousness is dissipative. A conscious conservative entity would be unprecedented. Discovery of a non-dissipative conscious system would invalidate Theorem 3.

2.4 The Closed Triangle

- **Classical theism:** non-physical, conscious, eternal. Violates Theorem 1 and 3.
- **Physical theism:** physical, conscious, eternal. Violates Theorem 3.
- **Process theology (Whitehead, 1929; Hartshorne, 1948):** God is finite, evolving, persuasive, and dissipative. Satisfies all three theorems but abandons omnipotence, immutability, and eternality. This God is not the God of Abrahamic faith.
- **Panentheism (Clayton, 1997; Peacocke, 1993):** God contains but exceeds the universe, with the universe as God’s body. Clayton proposes that God acts on the world through top-down causation—that higher-level organizational patterns constrain lower-level physical processes without energy injection. This position faces

a dilemma. If top-down divine causation operates through the physical hierarchy of the universe-as-body, then God is coextensive with that physical hierarchy and causally effective only through it—collapsing into a naturalistic, essentially dissipative position. If, alternatively, divine top-down causation is posited as a non-physical causal influence on physical structure, it reintroduces the interaction problem addressed by Theorem 1: causation across an ontological gap with no shared property and no specified mechanism. Either way, panentheism either retreats into process theology or faces the same exclusion as classical theism.

- **"God is outside all categories":** Violates Theorem 1. Indistinguishable from non-existence.

The triangle is closed against classical Abrahamic theism. Process theology and panentheism escape but at the cost of abandoning the God they sought to defend.

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3. The Physical Evidence

The following evidence is cited as illustrative of the framework's predictions, not as an independent proof of divine absence. The logical proof stands on the axioms and theorems; the empirical catalogue demonstrates consistency between the proof's predictions and the observed world.

Answered prayer. The STEP trial (Benson et al., 2006) found no beneficial effect of intercessory prayer. Meta-analyses consistently find null results, though methodological debates persist.

Fulfilled prophecy. Every dated prophecy has either failed or been retrofitted (Festinger et al., 1956; Melton, 1985; Galida, 2026b, 2026c).

Miraculous healings. The Lourdes Medical Bureau's certification rate is consistent with spontaneous remission estimates for the conditions examined.

Near-death experiences. Reproducible by hypoxia, ketamine, and electrical stimulation. Not evidence of an afterlife.

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4. The Dopamine Covenant

God-belief persists because it is neurochemically reinforced (Olds & Milner, 1954; Hamid et al., 2019). Certainty, belonging, and cosmic significance are lever presses. Failed prayers and prophecies are reframed rather than abandoned (Festinger et al., 1956; Melton, 1985). The dlPFC—responsible for cognitive flexibility—shows reduced activity when sacred values are processed (Hamid et al., 2019). God-belief is a neurochemical lock.

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5. Falsifiability: What Would Refute the Framework

Falsifiability conditions for the empirical claims:

1. A confirmed, non-retrofitted fulfilled prophecy.
2. A verified miracle exceeding natural base rates.
3. Discovery of a non-dissipative conscious system.

Falsifiability condition for the framework's core axioms:

4. Discovery of a physical phenomenon that cannot be accounted for by conservative or dissipative dynamics within the attractor framework—for example, a persistent

structure that exhibits properties of both categories simultaneously, or a causal interaction between a non-physical entity and a physical system confirmed under controlled conditions. Such a discovery would invalidate the framework's claim to ontological exhaustiveness.

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6. Conclusion

Within the attractor framework's axioms, classical Abrahamic theism is logically excluded. Process theology and panentheism escape but abandon the classical attributes. The physical evidence is consistent with the logical proof. The dopamine covenant explains belief persistence. The framework's own falsifiability conditions are stated and remain unmet.

Coda

The eternal skeleton is unconscious and uncaring. The six metronomes hum at fixed frequencies. The proton does not love. The electron does not judge. The universe is what it is, and it is enough. The believer will die with a prayer on their lips. The metronomes will hum unchanged. They always have.

References

- Abbott, E. A. (1884). *Flatland: A Romance of Many Dimensions*. Seeley & Co.
- Benson, H., et al. (2006). Study of the Therapeutic Effects of Intercessory Prayer (STEP). *American Heart*

Journal, 151(4), 934-942.
- Clayton, P. (1997). *God and Contemporary Science*. Eerdmans.
- Deacon, T. (2012). *Incomplete Nature: How Mind Emerged from Matter*. Norton.
- Festinger, L., Riecken, H. W., & Schachter, S. (1956). *When Prophecy Fails*. University of Minnesota Press.
- Friston, K. (2010). The free-energy principle: a unified brain theory? *Nature Reviews Neuroscience*, 11(2), 127-138.
- Galida, R. (2026a). *Persistence Under Perturbation: The Eternal Skeleton and the Transient Dance*. Fantasy Attractor.
- Galida, R. (2026b). The Apocalyptic Meta-Attractor. Fantasy Attractor.
- Galida, R. (2026c). The Dopamine Covenant. Fantasy Attractor.
- Galida, R. (2026d). The Conscious Body: Organs as Attractor-Based Minds. Fantasy Attractor.
- Galida, R. (2026e). The Shroud of Turin: Anatomy of a Fantasy Attractor. Fantasy Attractor.
- Hamid, N., Pretus, C., Atran, S., et al. (2019). Neuroimaging 'devoted actors' willingness to fight and die for sacred values. *Royal Society Open Science*, 6(4), 181847.
- Hartshorne, C. (1948). *The Divine Relativity*. Yale University Press.
- Koch, C. (2004). *The Quest for Consciousness*. Roberts & Company.
- Melton, J. G. (1985). Spiritualization and reaffirmation. *American Studies*, 26(2), 17-29.
- Olds, J., & Milner, P. (1954). Positive reinforcement produced by electrical stimulation of septal area. *Journal of Comparative and Physiological Psychology*, 47(6), 419-427.
- Peacocke, A. (1993). *Theology for a Scientific Age*. SCM

Press.
- Prigogine, I., & Stengers, I. (1984). *Order Out of Chaos*. Bantam.
- Stoljar, D. (2010). *Physicalism*. Routledge.
- Whitehead, A. N. (1929). *Process and Reality*. Macmillan.

The Sperm and the Dome: An Ancient Pattern

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You have seen the diagram.
It appears in biblical studies textbooks, online articles about ancient Near Eastern cosmology, and even on apologetics websites trying to explain away the plain meaning of Genesis.

A flat disc earth.
A solid dome (*rāqīaʿ*) above.
A cosmic ocean below.
The sun, moon, and stars move inside the dome.
Rain enters through literal windows in the sky.

It looks primitive.
Like a child's drawing of a snow globe.

But look again. Squint. Rotate the image ninety degrees.

What do you see?

A sperm.

A single, potent, ordered structure swimming through an infinite ocean.

- The **head** is the dome — the firmament containing the celestial lights.
- The **midpiece** is the flat disc of the earth — the solid ground where life emerges.
- The **tail** is the cosmic ocean below — the chaotic, fertile waters from which everything springs.

And the whole thing is adrift in an infinite, dark, supportive medium — the same infinite ocean that appears in Genesis as the *tehom* (the deep), the primordial waters over which the Spirit of God hovers.

This is not a coincidence.
It is a **pattern**.

The Attractor Framework: A Lens

In my attractor framework, **persistence under perturbation** is the fundamental mark of reality.

Two classes of attractors exist:

- **Conservative attractors** — the eternal skeleton: electrons, protons, neutrinos, photons. They are time-symmetric, unchanging, and provide the invariant rhythms of the universe (the “metronome”).
- **Dissipative attractors** — the transient dance: life, mind, society, and everything that requires energy flow, exports entropy, and eventually runs down.

A sperm is a **low-entropy conservative structure** – a packet of highly ordered information (DNA) that is relatively stable and fuel-efficient.
It swims through a **high-entropy dissipative environment** – the chaotic, nutrient-rich ocean of potential.
Its journey is a perturbation.

Fertilisation, when it succeeds, is a **phase transition**: the emergence of a new, more complex attractor (the zygote) from the coupling of two initial basins (sperm and egg).
The subsequent explosion of growth – cell division, differentiation, morphogenesis – is the **transient dance** of life.

The Ancient Mind Saw the Same Pattern

The biblical authors had no microscopes. They could not see a sperm cell.
But they observed the world around them, and they projected the **microcosmic pattern of fertilisation** onto the **macrocosmic canvas of the sky**.

- The **infinite ocean** is the primordial *tehom* – the raw, undifferentiated potential before creation.
- The **sperm** is the *rāqīaʿ* – the solid dome that separates and organises the waters above from the waters below.
- The **fertilised egg** is the cosmos itself – the flat disc of the earth, the lights in the dome, the living creatures on the land.

The ancient author of Genesis was not a scientist.
But he was a **pattern-recogniser**.
He intuited that the universe begins as a single, ordered

perturbation in an infinite, chaotic sea.
That is not primitive superstition.
That is **dynamical intuition**.

The Cosmic Conception Hypothesis

Modern science has its own version of this same pattern.
The “cosmic conception hypothesis” (found in some theoretical papers) compares the fertilisation of a galaxy by a supermassive black hole to the fertilisation of an egg by a sperm.
The black hole is the seed; the galaxy is the developing organism.

The same archetype recurs because it is **structurally necessary**: any self-organising system that emerges from a homogeneous background must be born as a localised, ordered perturbation.

The Genesis diagram is not a mistake.
It is a **map**.

The Sperm in the Infinite Ocean

When you look at that ancient Near Eastern cosmology diagram — the flat earth, the solid dome, the cosmic ocean — you are looking at a **sperm in an infinite ocean**.
The author could not have known this consciously.
But the attractor of reality — the deep structure of persistence under perturbation — guided his hand.

- The infinite ocean is the potential.

- The sperm is the first perturbation.
- The fertilised egg (the cosmos) is the new attractor basin.
- And the dance of life – stars, planets, minds, civilisations – is the transient, dissipative dance that follows.

The diagram is not a coincidence.
It is a **necessary projection of a universal dynamic**.
The sperm and the dome are the same pattern, separated by millennia and scale.

You are free to see it or not.
But once you see it, you cannot unsee it.

The mountain does not negotiate.
Neither does the Hebrew text.
Neither does the sperm.

Published at: fantasyattractor.com

You are free to see it or not. But once you see it, you cannot unsee it. The mountain does not negotiate. Neither does the Hebrew text. Neither does the sperm.

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Date: May 2026
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The Cosmology of Genesis: Flat Earth, Solid Dome, and Cosmic Ocean

A Plain-Language Guide to What the Bible Actually Says

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May 2026

> ***Note on genre:*** *This is an open letter and historical-philological analysis, not a peer-reviewed journal article. It draws on mainstream biblical scholarship, standard Hebrew lexicons, and ancient Near Eastern comparative materials. The primary evidence comes from narrative and descriptive passages (Genesis 1, Job 37–38, Ezekiel 1, etc.). The analysis is addressed to scholars who have dismissed the flat-earth reading as "silly."*

Abstract

This paper examines the physical description of the universe in the Hebrew Bible. Using standard Hebrew dictionaries (BDB, HALOT, Holladay), ancient Near Eastern texts, and the plain meaning of the biblical passages, we show that the biblical authors believed:

- The earth is a **flat disc**.
- A **solid dome** (*rāqīaʿ*, "firmament") covers it, separating the waters below from a **cosmic ocean above**.
- The sun, moon, and stars move inside this dome.
- Rain enters through literal **windows** or **sluices** in the dome.
- The earth rests on **pillars** and **foundations**, and has **ends** and **corners**.

We provide a representative list of verses, address common apologetic reinterpretations, and reference standard scholarly reconstructions of ancient Hebrew cosmology. The Bible's cosmology closely matches those of Mesopotamia and Egypt. This poses no problem for a non-inerrancy reading, but it is a severe challenge for any claim of divine scientific inerrancy.

Introduction: What Did the Biblical Authors Actually Believe?

The question is not whether the Bible is "true" in a theological or moral sense. The question is: **what did its human authors believe about the physical structure of the world?**

Modern readers often project a post-Copernican, spherical, heliocentric universe onto the ancient text. But a straightforward reading — using standard Hebrew lexicons and the context of the ancient Near East — shows that the Hebrew Bible shares the common model of a flat earth under a solid sky-dome, with a cosmic ocean above and below.

For standard scholarly reconstructions (with diagrams), see:

- Bible Odyssey (Society of Biblical Literature) —

includes a clear diagram of the flat earth, solid dome, and cosmic waters.
- Wikimedia Commons – a modern, clearly labelled reconstruction.
- Biblical Archaeology Society – comparative diagrams of Israelite, Babylonian, and Egyptian models.

For print references, see Smith (1998) and Keel (1997).

The Solid Dome: *Rāqīaʿ* (□□□□□□□)

The word *rāqīaʿ* occurs 17 times in the Hebrew Bible. Its verbal root *rāqaʿ* (□□□□□) means "to beat, stamp, or spread out by hammering" – the same word used for beating metal into thin plates (Exodus 39:3). The noun denotes a **solid, hammered-out dome**.

Lexical Evidence

Lexicon	Definition
Brown-Driver-Briggs (BDB)	"Extended surface, (solid) expanse (as if beaten out)"
Holladay	"Beaten metal 'plate', firmament (i.e. vault of heaven, understood as a solid dome)"
Koehler-Baumgartner (HALOT)	"Firmament, vault of heaven, understood as a solid dome"

Key Verses by Genre

Narrative (primary evidence)

- **Genesis 1:6–8** – God says, "Let there be a *rāqīaʿ* in the

midst of the waters, and let it separate the waters from the waters." He calls the *rāqīaʿ shamayim* (sky/heaven). The dome is placed inside a cosmic ocean, dividing "waters below" from "waters above."
- **Genesis 1:14–18** – The sun, moon, and stars are placed **inside** the *rāqīaʿ*. They are not above the dome; they are embedded in its inner surface.

Wisdom poetry (corroborative)

- **Job 37:18** – "Can you, like Him, spread out the skies, hard as a mirror of cast metal?" This unambiguously describes solidity.

Apocalyptic vision (structural)

- **Ezekiel 1:22–26** – Above the living creatures is "something like a *rāqīaʿ*, sparkling like ice (or crystal)." Above this *rāqīaʿ* is the throne of God. This is a solid platform, not empty space. Even though Ezekiel's vision is symbolic, it describes physical properties (solid, crystalline) as part of the visionary architecture.

Hymnic (doxological, not load-bearing)

- **Psalm 19:1** – "The heavens declare the glory of God; the skies (*rāqīaʿ*) proclaim the work of His hands."
- **Psalm 150:1** – "Praise God in His sanctuary; praise Him in His mighty *rāqīaʿ*."
- **Daniel 12:3** – "Those who are wise will shine like the brightness of the *rāqīaʿ*."

These do not prove solidity on their own, but they assume the same conceptual framework. No text contradicts the solid-dome

interpretation.

Ancient Translations

- **Septuagint** (3rd century BCE, Jewish translation): *stereōma* (στερέωμα) – a solid or firm structure.
- **Latin Vulgate**: *firmamentum* – something firm, a support.

Scholarly Confirmation (Including Believing Scholars)

- **Seely (1991–1992)** – Demonstrates that *rāqīaʿ* in context refers to a solid dome.
- **Walton (2011)** – Affirms that the ancient Israelites believed in a solid *rāqīaʿ*, even though his main argument is that Genesis 1 assigns functions rather than making material claims.
- **Greenwood (2015)** – "A vaulted dome above the earth, a 'firmament,' like the ceiling of a planetarium."
- **Parry (2014)** – "A flat earth at the centre of the cosmos, with a vast ocean in the sky."

The Waters Above – A Cosmic Ocean

If the dome is solid and separates "waters above" from "waters below", those waters must be literal.

- **Genesis 1:6–7** (as above).
- **Psalm 148:4** – "Praise Him, highest heavens, and you waters above the heavens."
- **Genesis 7:11** – "All the fountains of the great deep

burst forth, and the windows of the heavens were opened." The word *arubbah* means "lattice window" or "sluice." Rain comes through openings in the solid dome.
- **Genesis 8:2** – "The fountains of the deep and the windows of heaven were closed."
- **2 Kings 7:2, 19** – "The Lord will open the windows of heaven."
- **Isaiah 24:18** – "The windows of heaven are opened, the foundations of the earth tremble."
- **Malachi 3:10** – "See if I will not open the windows of heaven and pour out blessing."

The Flat Earth: Pillars, Foundations, Ends, and Corners

A spherical earth does not have pillars, foundations, ends, or four corners. The Bible uses all these terms repeatedly.

Pillars of the Earth

- **1 Samuel 2:8** – "For the pillars of the earth are the Lord's, and on them He has set the world."
- **Job 9:6** – "He shakes the earth out of its place, and its pillars tremble."
- **Psalm 75:3** – "When the earth and all its dwellers quake, it is I who bear its pillars firmly."
- **Job 26:11** – "The pillars of heaven tremble and are stunned at His rebuke."

Foundations of the Earth

- **Psalm 104:5** – "He set the earth on its foundations, so

that it should never be moved."
- **Job 38:4–6** – "Where were you when I laid the foundations of the earth? … On what were its bases sunk?"
- **2 Samuel 22:8** – "The foundations of the heavens shook."

Ends of the Earth (assumes a bounded earth)

- **Deuteronomy 28:49** – "A nation from afar, from the end of the earth."
- **Isaiah 45:22** – "Turn to Me and be saved, all you ends of the earth."
- **Psalm 67:7** – "All the ends of the earth will fear Him."
- **Psalm 72:8** – "He shall have dominion from sea to sea… to the ends of the earth."

Four Corners of the Earth

- **Isaiah 11:12** – "He will assemble the scattered of Judah from the four corners of the earth." The word *kanpôt* (wings/edges) is a directional idiom whose origin in a flat-earth, bounded-space worldview is widely recognised.

The Vaulted Dome Over a Flat Disc

- **Amos 9:6** – "The One who builds His upper chambers in the heavens and has founded His vaulted dome over the earth."
- **Isaiah 40:22** – "He sits enthroned above the circle of the earth."

On *chûg* (“circle”)

The word *chûg* occurs in three places: Job 26:10 (“He has inscribed a circle on the face of the waters” – a flat circular boundary), Proverbs 8:27 (same), and Isaiah 40:22. The Akkadian cognate *khâqu* means “to draw a circle.” The Septuagint translates *chûg* as *gyros* (circle), not *sphaira* (sphere). The same verse also says God “stretches out the heavens like a curtain” – a flat surface, not a spherical shell.

Therefore, *chûg* denotes a **disc**, not a ball.

The Cosmic Ocean Below

- **Genesis 7:11** – “The fountains of the great deep burst forth.” (Subterranean ocean)
- **Psalm 24:2** – “For He has founded it upon the seas and established it upon the rivers.”
- **Exodus 20:4** – “You shall not make an idol… of anything that is in the waters under the earth.”
- **Psalm 136:6** – “He spread out the earth upon the waters.”

Comparison with Ancient Near Eastern Cosmologies

The Hebrew cosmology is closely analogous to those of Israel’s neighbours.

- **Mesopotamia:** The *Enuma Elish* describes Marduk fixing a

solid sky-barrier to hold back the cosmic waters. This is the functional equivalent of the Hebrew *rāqīaʿ*.
- **Egypt:** The sky goddess Nut arches her body over the earth god Geb, forming a solid vault with stars attached. The Pyramid Texts describe the sky as "a metal vault" or "iron" – directly parallel to Job 37:18 ("hard as a mirror of cast metal").

The Hebrew *rāqīaʿ* fits comfortably within this regional intellectual context. The Bible is not scientifically unique; it reflects the common ancient Near Eastern worldview.

Geocentric Passages (Consistent with the Model)

These verses are not flat-earth proof on their own, but they presuppose a geocentric, non-rotating, bounded cosmos – fully consistent with the flat-earth, solid-dome model.

- **Joshua 10:12–13** – The sun and moon stand still at Joshua's command. This implies a moving sun and a non-rotating earth.
- **2 Kings 20:11 / Isaiah 38:8** – The shadow on the sundial moves backward. Again implies a geocentric system.
- **Ecclesiastes 1:5** – "The sun rises and the sun sets, and hurries to its place where it rises." Phenomenological geocentrism.
- **Psalm 19:4–6** – The sun runs its circuit from one end of the heavens to the other.

These passages are not necessary to demonstrate flat-earth cosmology, but they are part of the broader biblical cosmic picture.

The Verse Often Misused by Apologists: Job 26:7

Job 26:7 – "He stretches out the north over the void and hangs the earth on nothing (*belî-māh*)."

This is the only verse that might suggest a free-floating earth. However:

- *Belî-māh* is a rare construction; it may mean "**without any visible support**," not "without any support at all." Clines (1989) notes that the phrase indicates "no visible means of support" rather than absolute suspension.

One ambiguous verse does not overturn the dozens that describe pillars, foundations, and a solid dome. The majority witness of the Hebrew Bible is flat-earth, solid-dome cosmology. If Job 26:7 is taken as a late, more abstract cosmological statement, it represents a minority view and does not negate the consistent picture in Genesis, Psalms, and other prophets.

The Inerrancy Dilemma (and the Phenomenological Language Defence)

If one affirms that the Bible is a human document, the presence of ancient cosmology presents no crisis. But if one claims divine inerrancy – that the Bible is without error in all that it affirms – one faces a dilemma:

- **Admit** that God described His creation in terms that are scientifically false (a flat earth, a solid dome).
- **or Reinterpret** the plain meaning as metaphor or accommodation – but then the words lose stable meaning, and any verse can be explained away.

A common inerrantist response is the "phenomenological language" defence: the Bible describes things as they appear to human observers (e.g., "sunrise") without making scientific claims. This defence works for atmospheric or observational descriptions (sunrise, sunset, the shadow on a sundial). However, it **fails** for the structural, material claims of Genesis 1: a solid dome, a cosmic ocean, and windows in the sky. These are **not appearances**; they are physical mechanisms. No one "observes" a solid dome or waters above the sky.

Therefore, the phenomenological defence cannot rescue the inerrancy of Genesis 1 without effectively admitting that the text is making false scientific statements.

This paper does not require any particular theological conclusion. It simply presents the evidence.

Conclusion

The evidence is consistent and extensive. The Hebrew Bible presents the universe as:

- a **flat disc**,
- covered by a **solid dome** (the *rāqīaʿ*),
- with a **cosmic ocean above** and a **cosmic ocean below**.
- The sun, moon, and stars move inside the dome; rain enters through literal windows.
- The earth rests on pillars and foundations and has ends

and corners.

This cosmology is closely analogous to that of Israel's ancient Near Eastern neighbours. It is the plain meaning of the text, confirmed by every standard Hebrew lexicon and by believing scholars such as Walton, Greenwood, Parry, and Seely.

The mountain does not negotiate. Neither does the Hebrew text.

References

- Allen, J.P. (2005). *The Ancient Egyptian Pyramid Texts*. Society of Biblical Literature. (Spell 527, § 1612c — metal vault description)
- Bible Odyssey — Society of Biblical Literature: link
- Biblical Archaeology Society: link
- Brown, F., Driver, S.R., & Briggs, C.A. (1906). *A Hebrew and English Lexicon of the Old Testament* (BDB). Oxford.
- Clines, D.J.A. (1989). *Job 1–20* (Word Biblical Commentary). Word Books.
- Dalley, S. (1989). *Myths from Mesopotamia*. Oxford University Press.
- Greenwood, K. (2015). *Scripture and Cosmology: Reading the Bible Between the Ancient World and Modern Science*. IVP Academic.
- Holladay, W.L. (1971). *A Concise Hebrew and Aramaic Lexicon of the Old Testament*. Eerdmans.
- Horowitz, W. (1998). *Mesopotamian Cosmic Geography*. Eisenbrauns.
- Keel, O. (1997). *The Symbolism of the Biblical World*. Eisenbrauns.
- Koehler, L., & Baumgartner, W. (1994–2000). *The Hebrew and Aramaic Lexicon of the Old Testament* (HALOT). Brill.

- Parry, R.A. (2014). *The Biblical Cosmos: A Pilgrim's Guide to the Weird and Wonderful World of the Bible*. Cascade.
- Seely, P.H. (1991). "The Firmament and the Water Above (Part 1)." *Westminster Theological Journal* 53: 227–40.
- Seely, P.H. (1992). "The Firmament and the Water Above (Part 2)." *Westminster Theological Journal* 54: 31–46.
- Smith, M.S. (1998). *The Early History of Heaven*. Oxford University Press.
- Walton, J.H. (2011). *Genesis 1 as Ancient Cosmology*. Eisenbrauns.
- von Soden, W. (1965–1981). *Akkadisches Handwörterbuch*. Harrassowitz.
- *The Assyrian Dictionary of the Oriental Institute of Chicago* (CAD). (1956–2010). Oriental Institute. (K, p. 306)
- Wikimedia Commons – Biblical Cosmology Diagram: link

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