

Magnetic Fluidic Computing

Circulation, Admissibility, and the Architecture of Trajectory

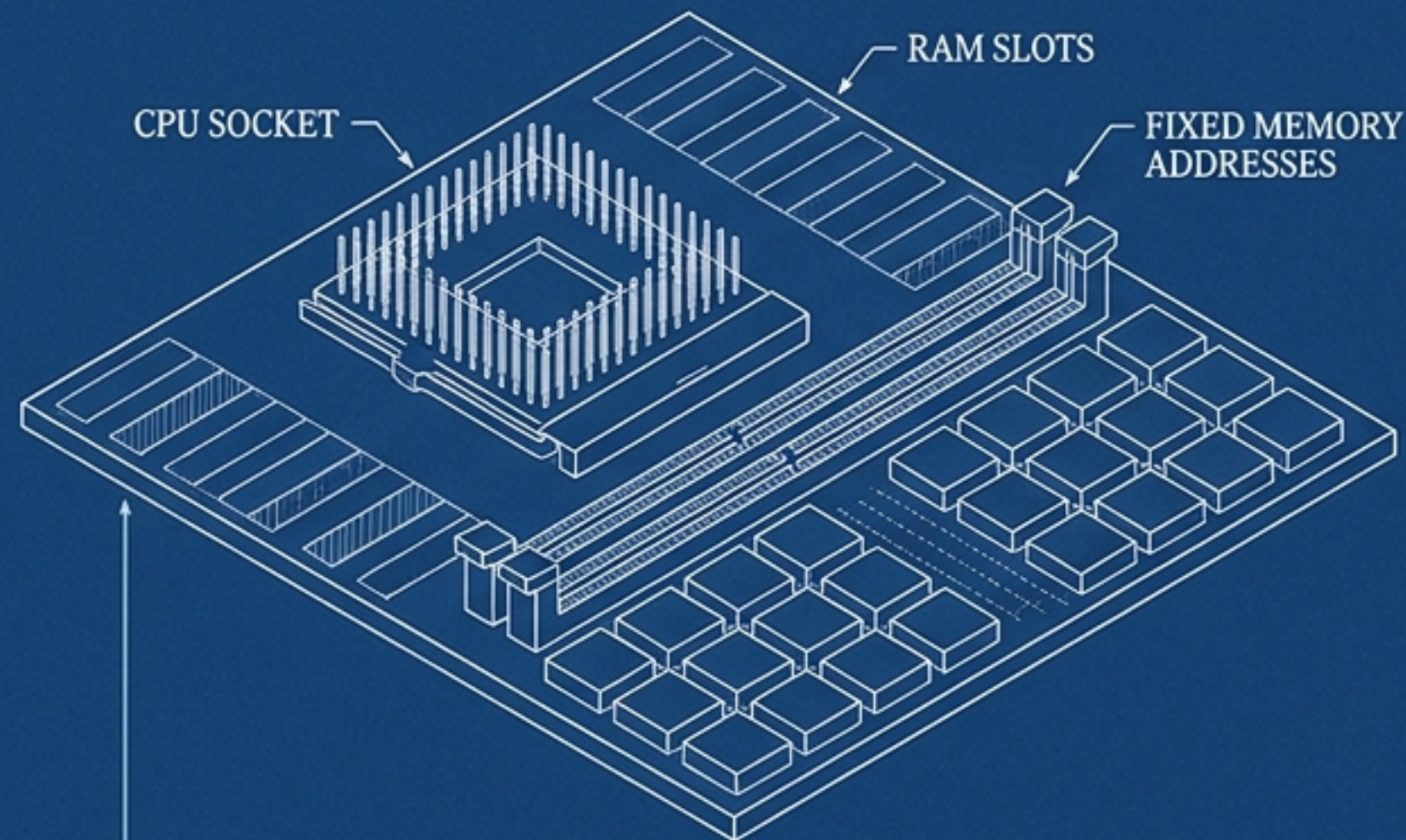
Core Premise: A speculative hardware architecture suggesting computation, memory, identity, and agency are all special cases of recurrent admissibility structure.

Flyxion

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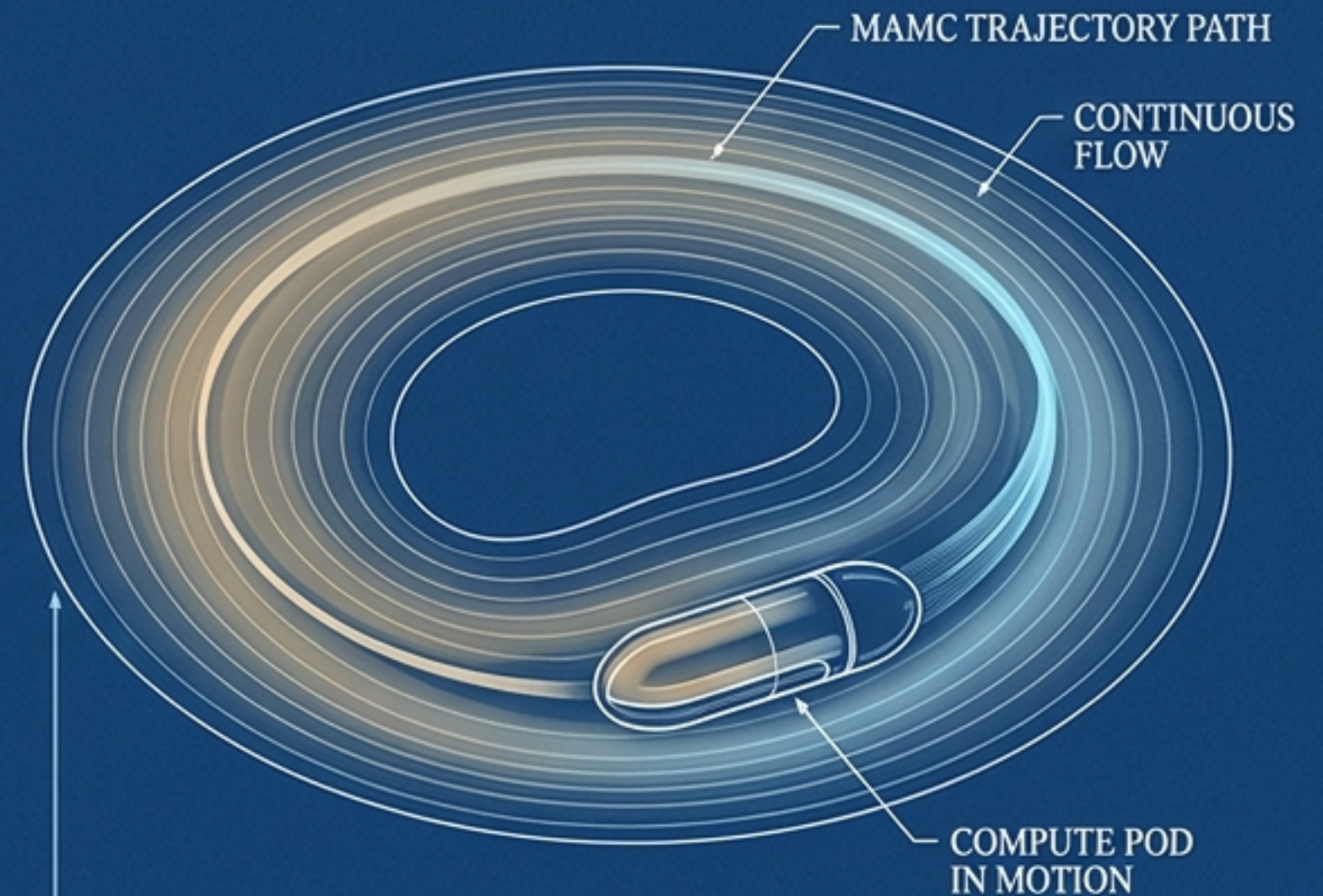
The Metaphysics of Location

The Status Quo: Architecture of Storage



Argument: Every computing architecture encodes a metaphysics. Conventional digital computing encodes a metaphysics of location and storage. A CPU occupies a socket; memory occupies fixed addresses; information persists in specific places.

The Inversion: Architecture of Trajectory



MAMC proposes a radical transition. Compute pods circulate continuously through a thermodynamic system. No pod is permanently positioned.

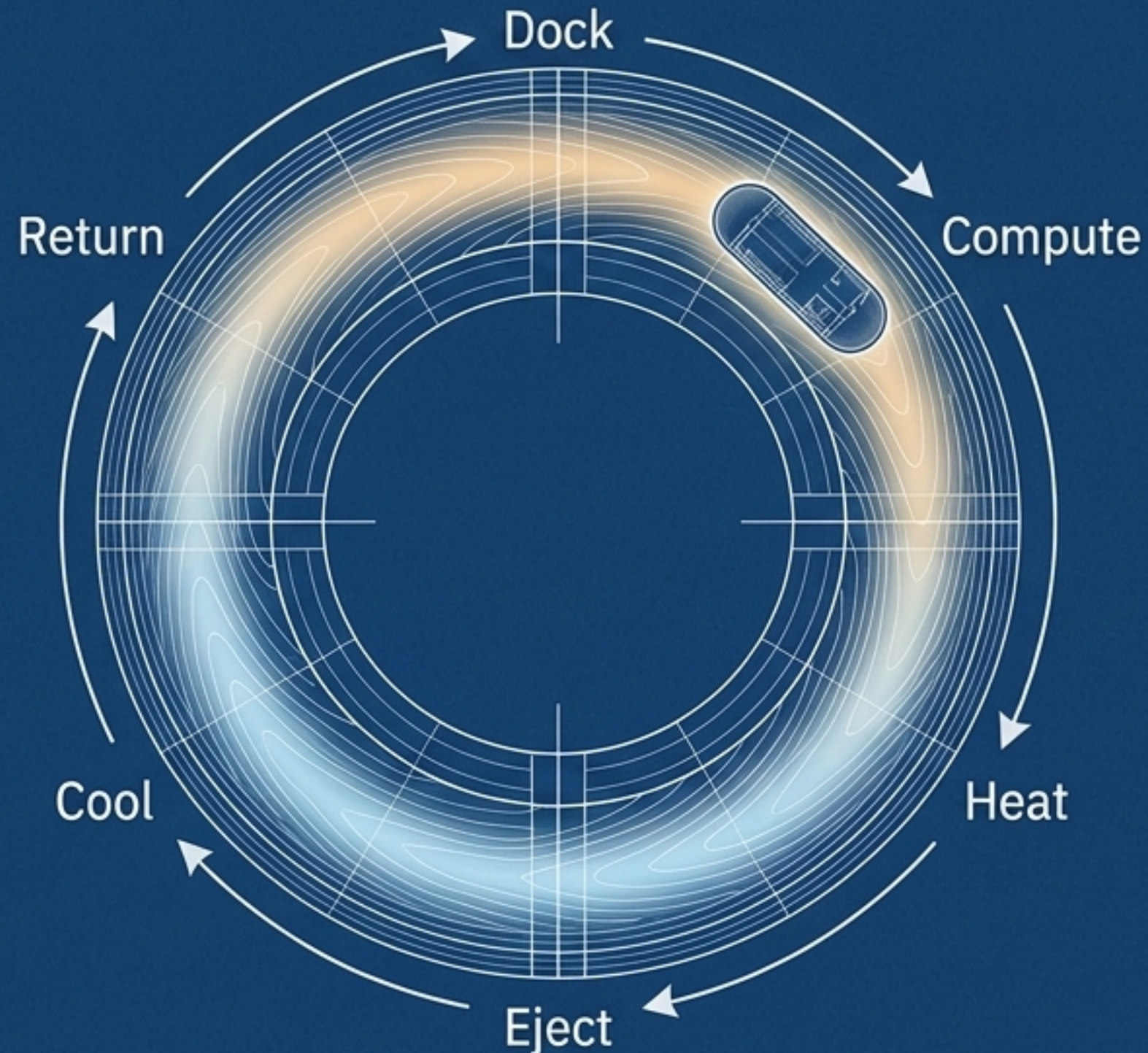
Key Takeaway: A processor at rest is computationally inert. A processor in motion, following a coherent route, is a computational event.

The Circulation Loop

Dock → Compute → Heat → Eject → Cool → Return → Dock

Engineering
Mechanics:

Encapsulated
compute pods
circulate under
magnetic control
through a routing
layer of
electromagnets.
Cooling operates on
phase-change
principles in a
dedicated bath.



Thermodynamic Formula:
Dwell time before ejection



$$\tau_{\text{dwell}} = \frac{C(T_e - T_r)}{P}$$

(Where C = thermal capacitance,
 T_e = ejection threshold,
 T_r = return threshold,
P = dissipated power).

Hub Duty Cycle:

$$\eta = \frac{\tau_{\text{dwell}}}{\tau_{\text{dwell}} + 2\tau_{\text{transit}} + \tau_{\text{cool}}}$$

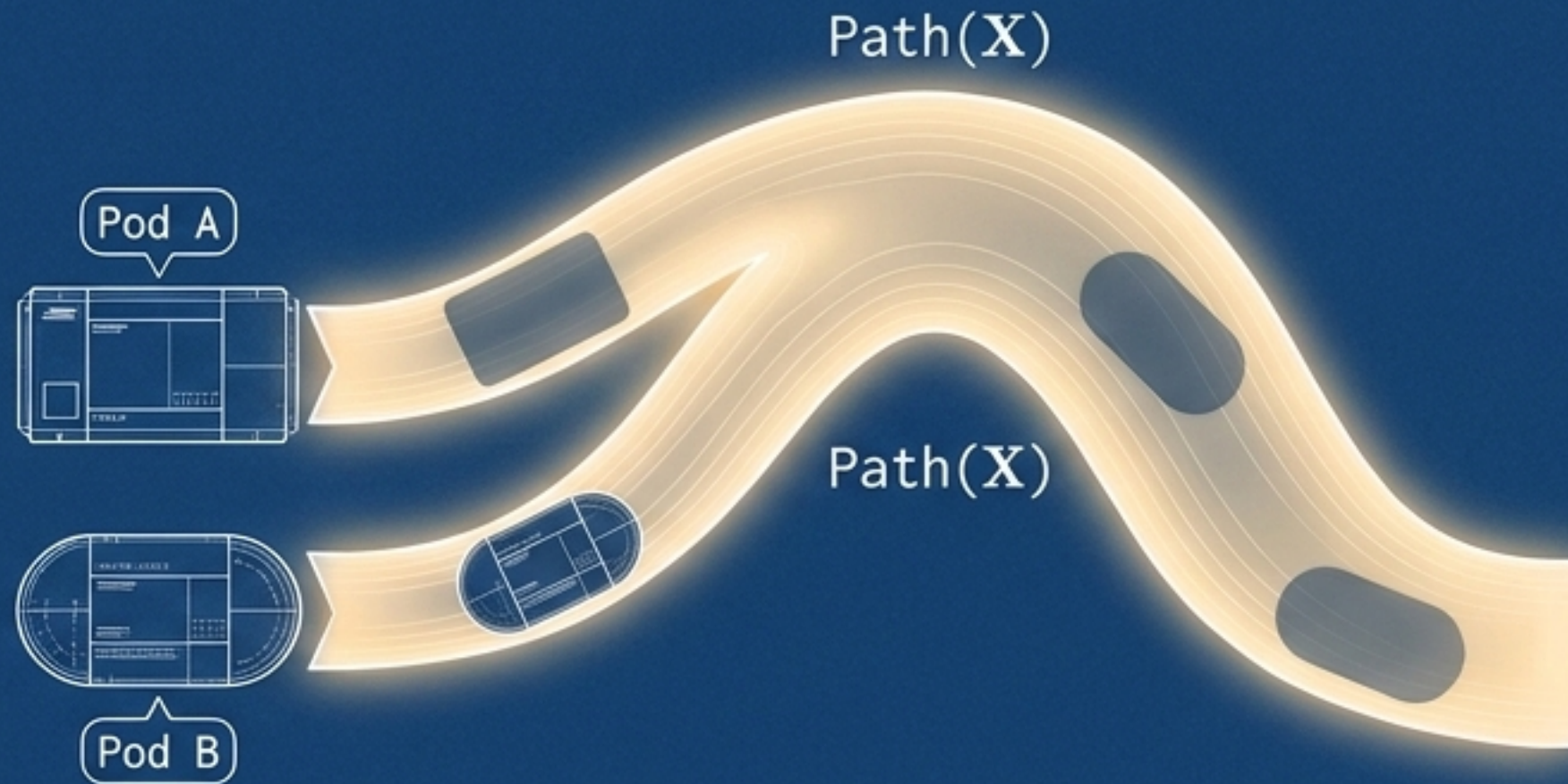
Storage vs. Trajectory: The Ontological Divide

Dimension	Storage (Traditional) 	Trajectory (MAMC) 
Primitive Entity	Objects occupying fixed locations	Paths through constrained space (morphisms)
Hardware Identity	Continuity of physical components	Persistence of a circulation pattern
Memory	Information persisting in a designated slot	Recurrence of a trajectory across time
Entropy	Waste heat to be expelled	Accessibility of admissible future paths
Agency	Expression of a global internal model	Emergent product of coordinated constraint navigation

Identity as Trajectory

From Objects to Morphisms

In category theory space $\text{Path}(X)$, the primary structure is entirely determined by paths (morphisms) rather than points (objects). MAMC is naturally modeled where X is physical routing space.



The Trajectory-Identity Thesis (Theorem 4.3)

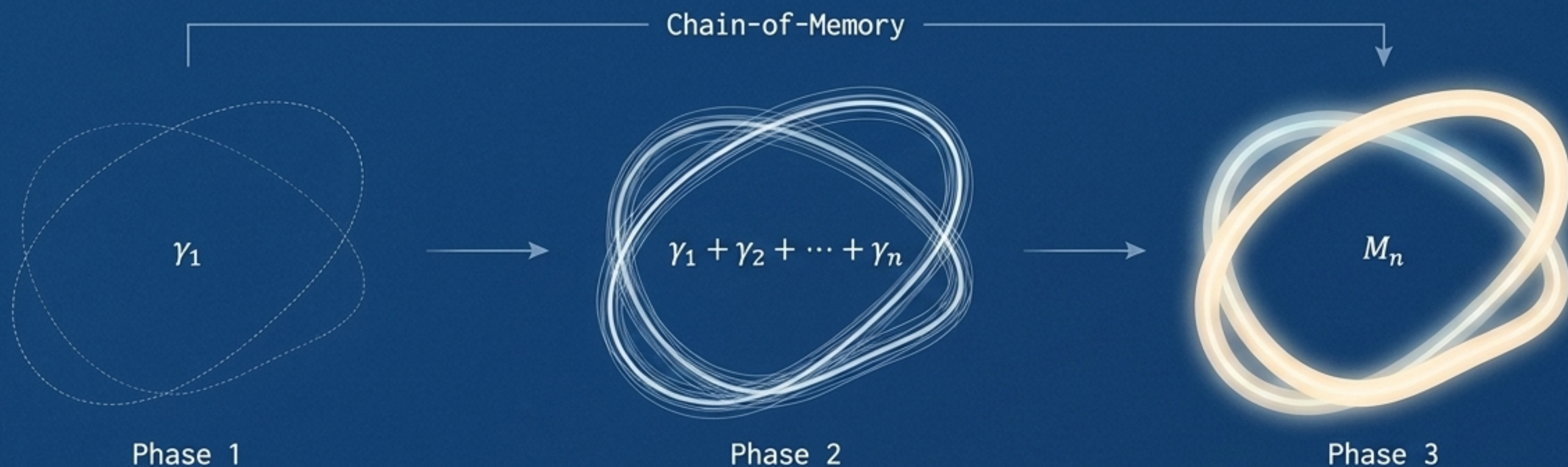
Two identical hardware pods following different routes are architecturally different entities.

Two different pods following identical routes are completely interchangeable.

RSVP Formalization:

In the Relativistic Scalar-Vector Plenum framework, physical entities are patterns of constraint on admissible trajectories. The machine computes by shaping admissibility potential Φ , not executing instructions at fixed coordinates.

Memory as Recurrence



The Concept

Memory in MAMC is not a location to be searched, but a stable current to be re-entered.

Information is encoded in the structure of recurrence.

Mathematical Definition

Trajectory memory after n circuits:

$$M_n = \bigcup_{i=1}^n \gamma_i$$

The Chain Operator (each state encodes a reference to its predecessor):

$$C[\gamma_i] = \gamma_{i+1}$$

Memory Loss

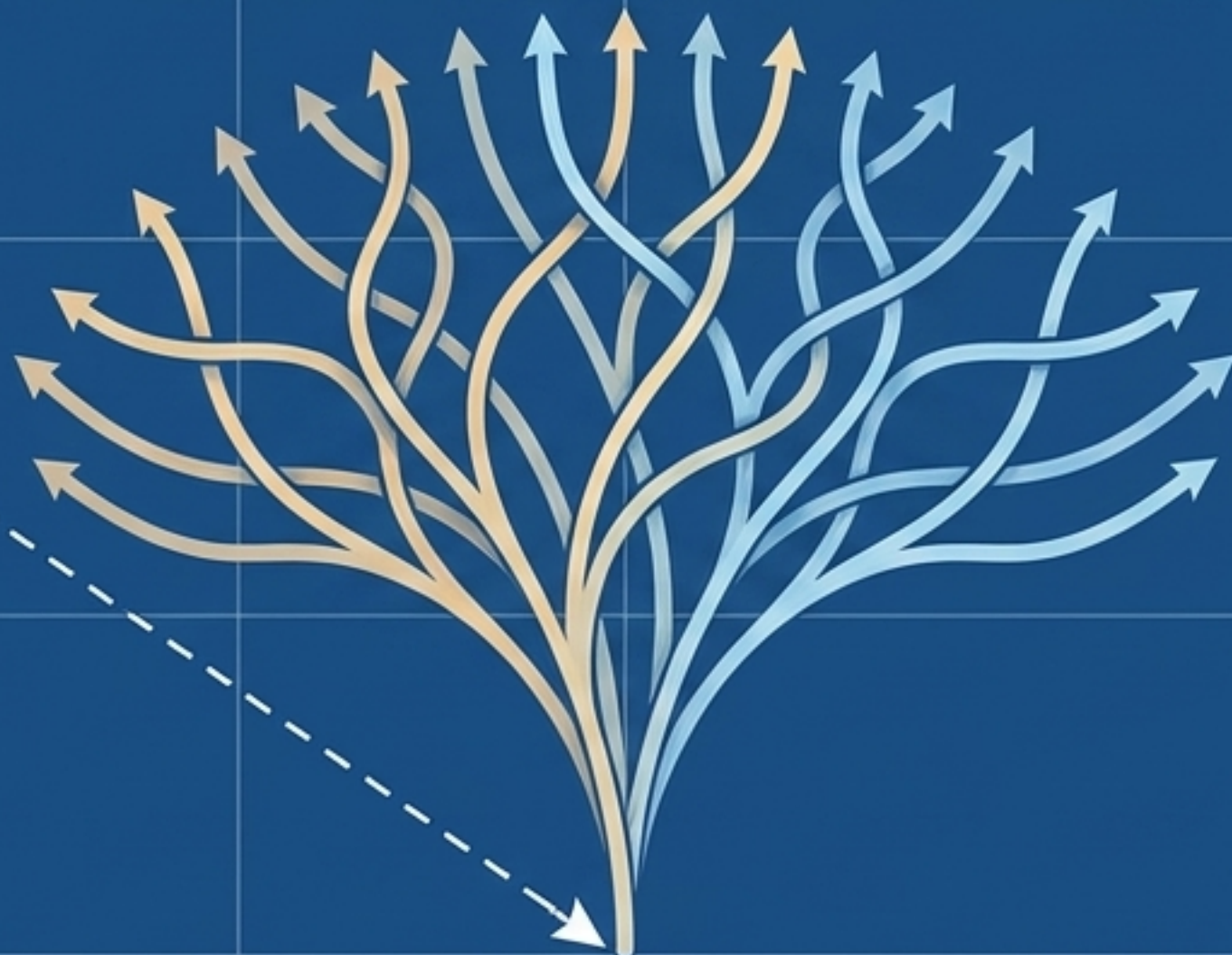
Forgotten memory is not deleted; it simply loses the pathways required for recurrence.

If circulation ceases ($\dot{x} = 0$), trajectory memory freezes—robust to hardware replacement but vulnerable to topological shifts.

The Entropy Inversion



Thermodynamic
Entropy (T)



Accessibility
Entropy (S_{acc})

Accessibility Entropy (S_{acc}) = $\log |A(x, T)|$
Measures the cardinality of admissible future paths available to a pod.

The Duality:

A conventional computer treats heat as pure waste. In MAMC, heat is a control signal that partitions the space of admissible futures.

The Accessibility Restoration Theorem

Operations that reduce thermodynamic temperature simultaneously increase semantic possibility.

$$\frac{\partial S_{acc}}{\partial T} < 0$$

The Core Insight: The cooling cycle is an accessibility engine. Computation consumes future possibilities in exchange for physical heat; cooling restores those futures.

The Geometry of Routing

The Accessibility Metric

Physical geometry is overridden by routing geometry. The distance d_A measures computational cost to move a pod, discounted by the accessibility of the region.

Hidden Curvature

The divergence of the accessibility flow defines the curvature:

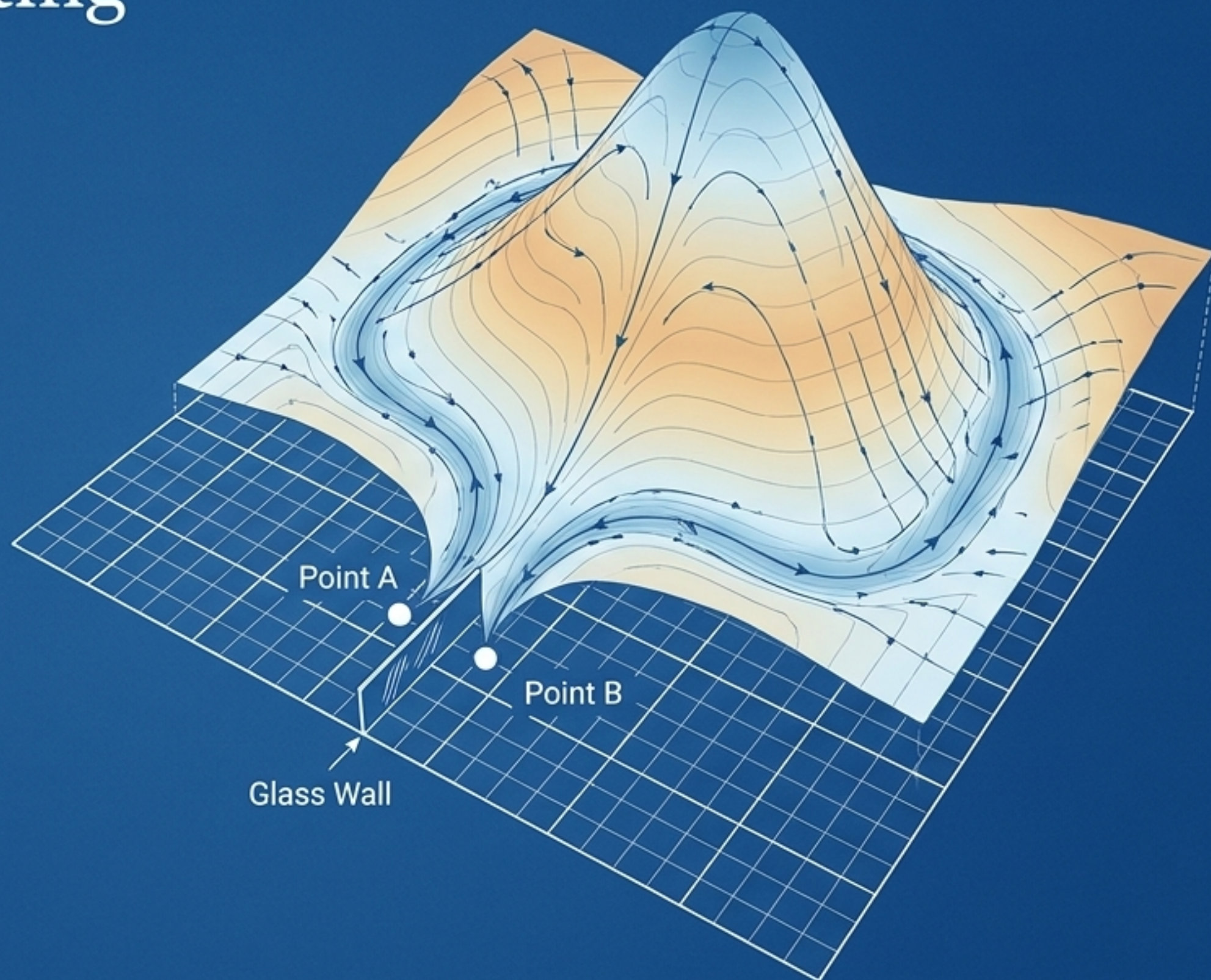
$$K(\mathbf{x}, T) = \nabla^2 S_{\text{acc}}(\mathbf{x}, T)$$

Attractors and Repellers

- **Positive Curvature** ($K > 0$): Attractive regions (cool, well-connected ports).
- **Negative Curvature** ($K < 0$): Repelling regions (hot zones, ejection ports).

Density Dynamics

Equilibrium pod density is proportional to $e^{S_{\text{acc}}(\mathbf{x}, T)}$



CLIO & Hamiltonian Dynamics

The Constraint Field

MAMC operates under the Constraint-Layered Information Ontology (CLIO), evolving as a gradient flow on a constraint landscape $\Phi(\mathbf{x}, T)$.

MAMC Hamiltonian:

$$H(\mathbf{x}, \boldsymbol{\pi}, T) = \frac{\|\boldsymbol{\pi}\|^2}{2m_{\text{eff}}} + \Phi(\mathbf{x}, T)$$

Drag (λ)

Momentum ($\boldsymbol{\pi}$)

Constraint Landscape $\Phi(\mathbf{x}, T)$

Limit Cycle Γ

Driven-Dissipative Limit Cycle

The system maintains steady-state circulation through constant input of computational work (heat) and output to cooling. This forms a limit cycle Γ .

Coupled Dynamics

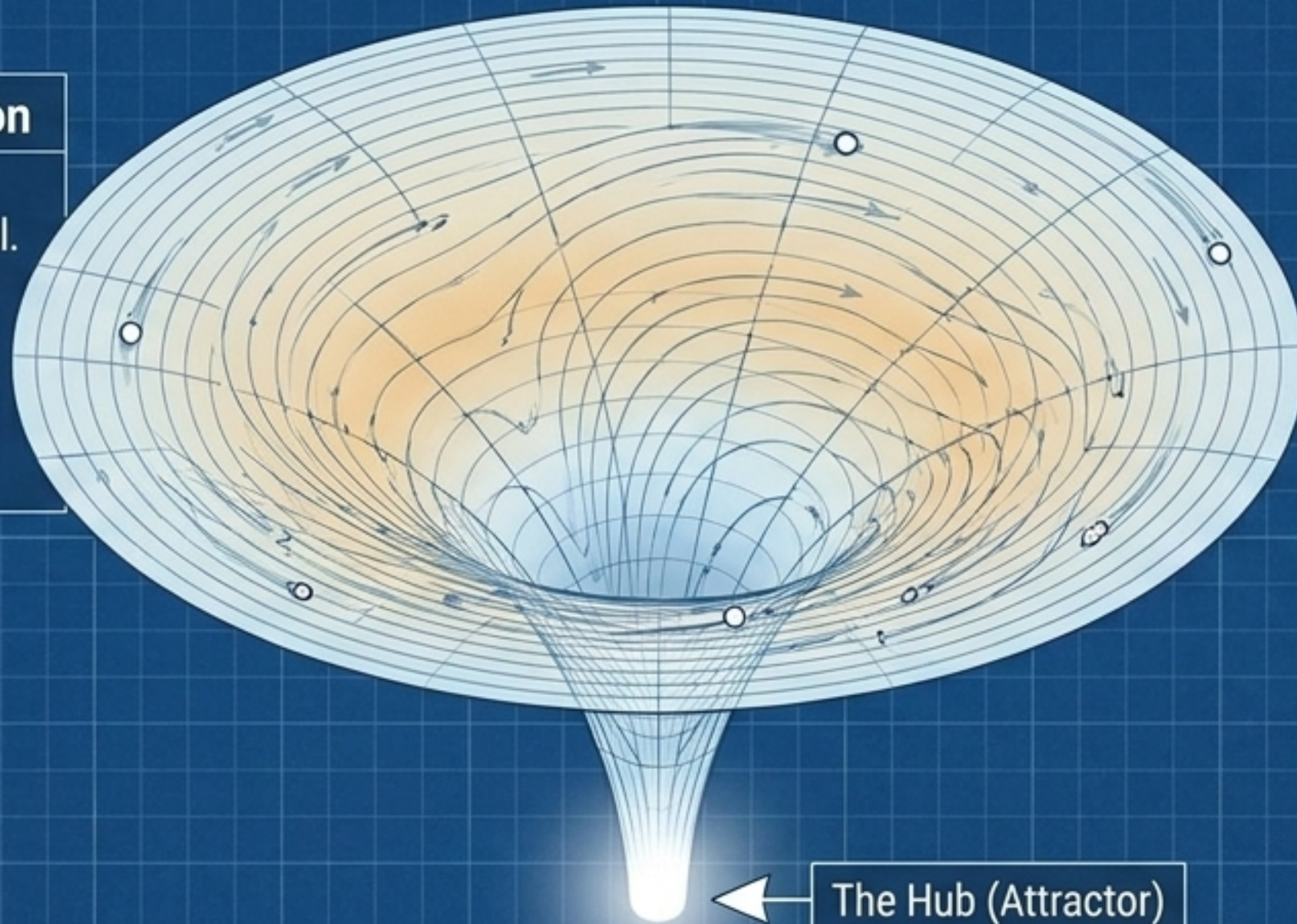
The thermal state alters the mechanical landscape. When a pod computes and heats ($\dot{T} > 0$), the landscape steeply tilts toward ejection. Cooling ($\dot{T} < 0$) flattens the landscape, allowing return.

Emergent Agency

Agency Without Representation

Pods appear intelligent—retreating when hot, seeking the hub when cool. Yet no pod represents a global goal or plots a route.

The illusion of intent is produced entirely by constraint navigation.



Simulated Goal Equation

A simulated goal G emerges where accessibility entropy has a global maximum at return temperature T_r :

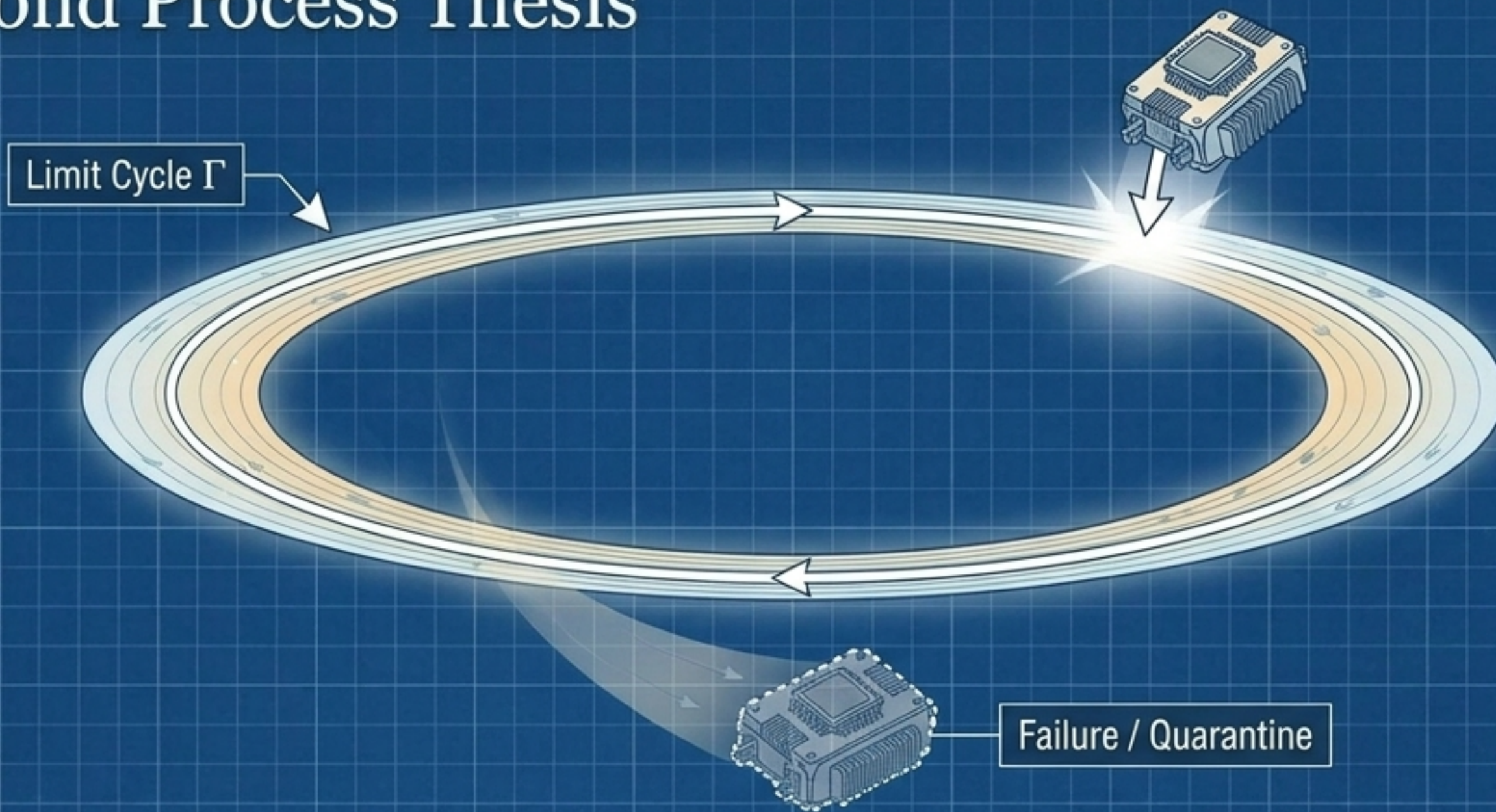
$$G = \operatorname{argmax}_{x \in \mathbb{R}} S_{\text{acc}}(\mathbf{x}, T_r)$$

The hub is the global attractor of the accessibility gradient flow. Goal-directedness is a property of the field geometry Φ , not internal logic.

Collective Intelligence

As pods alter local potentials through magnetic repulsion, the routing topology dynamically self-optimizes, matching hardware to workload exactly like an ant colony or a Hopfield network.

The Beyond Process Thesis



Solving the Ship of Theseus

If every compute pod in a MAMC system is gradually replaced over time, is it the exact same machine?

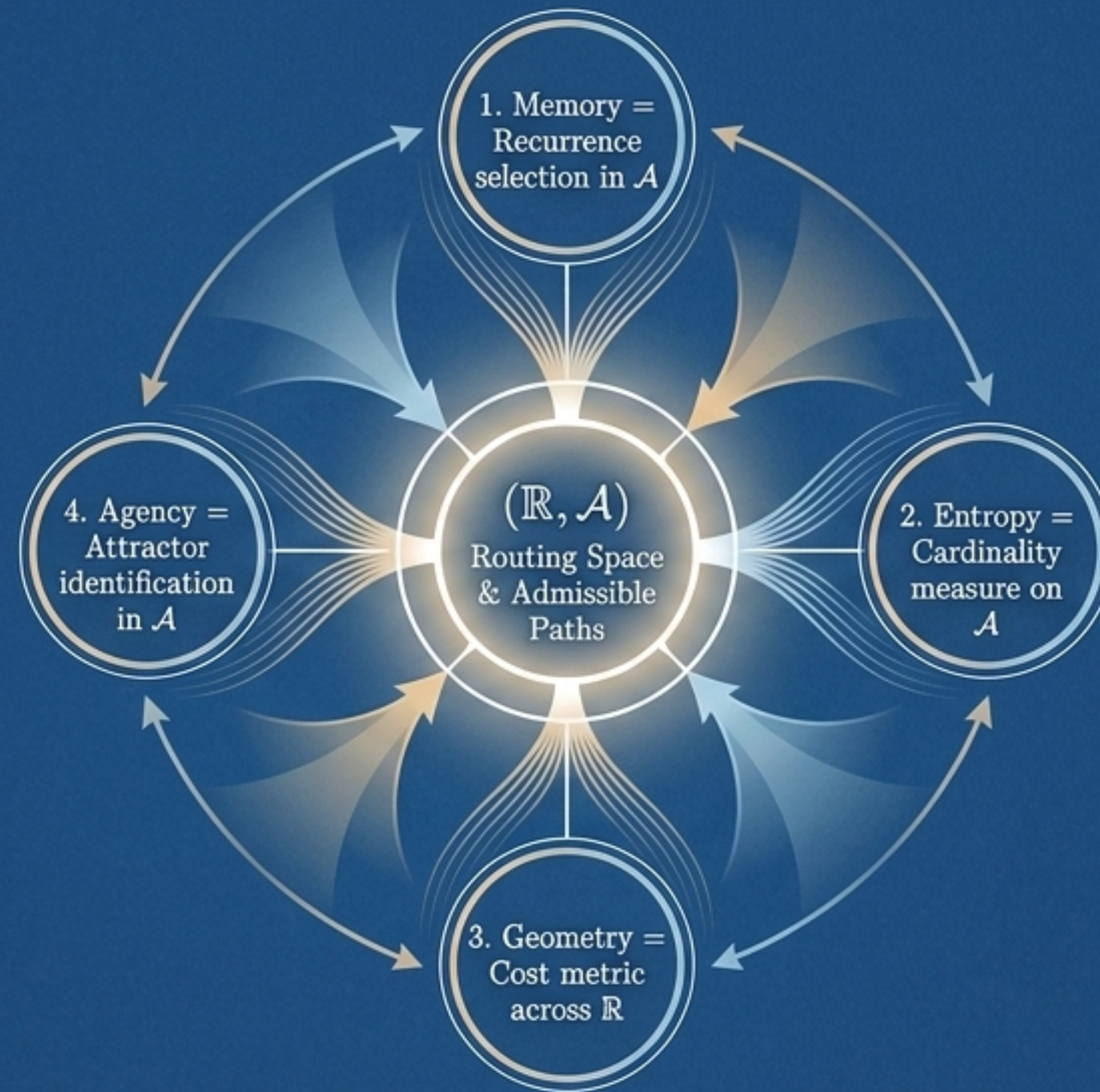
The Resolution

The machine's identity is constituted by the circulation pattern Γ , not the pod pool. Material continuity is irrelevant; structural continuity is absolute.

Admissibility as the Deepest Primitive

The machine is neither the hardware (substance ontology) nor the circulation (process ontology). The machine is the constraint field Φ that determines which circulations are possible.

Synthesis: Computation as Admissibility



Theorem 11.1

Memory, entropy, geometry, identity, and agency are not independent primitives. They are all derived by applying different operations to the identical foundational structure.

The machine is the shape of the possible. Computation is the act of traversing that shape. Memory is the trace left by repeated traversal. Identity is the stability of the pattern of return.