

# Mathematical Automata in Flipping Theory

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## Mathematical Automata in Flipping Theory

*An Essay*

Flipping Theory, in its broadest and most ambitious form, is not only a cosmological framework—it is a proposal for a new metaphysics of process. Its laws describe a universe that does not emerge from a singularity but unfolds continuously through the Incipient Law of Creation, ages its photons through a Gaussian drift of frequency, transforms energy types through sigma-defined distributions, and ultimately dissolves into the asymptotics of the Law of the Last Evidence. Beneath these laws lie not isolated equations but patterns—self-propagating structures that evolve according to rules. This is precisely the domain of mathematical automata.

In classical theory, automata are abstract machines: iterated, rule-governed, discrete or continuous systems capable of producing arbitrarily complex behavior from simple foundations. In Flipping Theory, these automata take on a new role. They become the scaffolding by which the universe computes its own becoming.

### 1. Automata as Engines of Emergence

The Incipient Law of Creation asserts a constant,  $c^3/G$ , as the mass-time flow from vacuum into being. This is not a “variable” so much as a clock—a metronome of emergence. Its constancy implies that the universe evolves in discrete physical “ticks,” though not discrete in the quantum or computational sense. Instead, the ticks are encoded in the foundational units  $R_k$ ,  $V_k$ , and  $I_k$ , the cosmic analogues of resistance, voltage, and current.

If one strips this law down to its mathematical skeleton, it resembles:

- State: the current configuration of mass-energy in spacetime
- Rule: the transformation at rate  $I_k$
- Update: continuous, but governed by thresholds set by  $R_k$  and  $V_k$
- Outcome: self-sustaining complexity

This is precisely the form of a continuous cellular automaton: the universe as a field of local updates that collectively produce structure. In Flipping Theory, every region of intergalactic vacuum acts as an incipient automaton cell—an infinitesimal site where mass appears, spacetime adjusts, and flippons are born.

### 2. Flippons as Automaton States

Flippons represent the universal ground state of matter: invisible, massive, extended units that fragment into the entire zoo of particles. They are the “minimal informational unit” of the cosmos.

Mathematically, each flippon can be understood as:

- A node in a cosmic automaton
- A state defined by its mass, non-interaction, and zero spin
- A rule controlling its self-fragmentation into smaller particles
- A limit defined by  $\sigma$ -intervals of the cosmic Gaussian
- A clock governed by  $tF$ , the fundamental time fragment

The fragmentation of flippons into particles resembles the operation of a recursive automaton: a rule that repeatedly transforms a parent state into offspring with different properties, guided by boundary conditions such as local curvature, energy density, and cosmic time.

In classical automata theory, recursion generates complexity; in Flipping Theory, flippon fragmentation generates physics itself.

### 3. The Gaussian Universe as an Automaton Grid

Under the Principle of Cosmic Energy Distribution, the universe's energy composition is mapped onto the integral areas of a Gaussian curve. This is a radical departure from standard cosmology—not a mere distribution, but a mathematical grid upon which physical processes manifest.

Each  $\sigma$ -interval becomes:

- A layer in a multi-level automaton
- A domain with unique transformation rules
- A boundary where transitions generate new phenomena

For example:

The 68.27% region (kinetic, or pseudo-dark-energy) behaves like a region of high update rate, driving expansion and cosmic flow.

- The 27.18% region (dark matter) corresponds to a slower, stabilizing domain where flippons dominate.
- The 4.28% region (ordinary matter) is a highly structured pocket of the automaton—small in measure but rich in emergent complexity.
- The 0.006% of gravitational waves is a nearly null state—an ultra-low-frequency automaton layer where only the faintest echoes propagate.

Thus the cosmos behaves like a stratified automaton: structure appearing not from chaos, but from the hierarchical geometry of the Gaussian.

### 4. Aging Photons as a Temporal Automaton

The Law of Aging Photons introduces a Gaussian decay of frequency over time, replacing redshift as a geometric effect with a physical aging process.

The formula

$$v(t) = v_o \exp\left(-\frac{t^2}{2\zeta^2}\right)$$

is not merely a decay curve; it is the update rule for an automaton embedded in time rather than space.

The time axis acts as:

- a one-dimensional automaton grid,
- each tick  $t \rightarrow t + \Delta t$  evolving the photon's internal state,
- until the last measurable evidence dissolves into noise at the far tails of the Gaussian.

This gives photons a computational identity: they carry not only energy but a record of the universe's time, encoded in their decaying frequency. They are messengers that update themselves continuously according to a cosmic rule.

## 5. The Law of Last Evidence as the Automaton's End State

Every automaton has terminal states—configurations from which no further evolution occurs. In classical terms, they are fixed points or attractors.

In Flipping Theory, the Law of Last Evidence defines the ultimate terminal state:

$$LME = D = T_B - T_A$$

vanishing of matter, space, and time.

This is the “halt condition” of the cosmic automaton:

the point at which the grid ceases to update because the grid itself has dissolved. Unlike classical automata, which halt explicitly, the universe halts by evaporation of its substrates. They do not die; they cease to be measurable—which, in Flipping Theory, is the same as ceasing to exist.

Thus the Law of Last Evidence plays the role of the automaton's absorbing boundary, the null configuration, the ultimate stillness.

## 6. Automata as the Hidden Logic of Flipping Theory

Taken together, Flipping Theory's laws form a coherent automaton framework:

- The Incipient Law provides the update rate.
- Flippons provide the initial states.
- The Gaussian Universe provides the grid and its layers.
- Photon Aging provides the time-evolution rule.
- The Last Evidence provides the halting condition.

The universe becomes a continuous, rule-governed, self-evolving mathematical machine. Not deterministic in the classical sense, not probabilistic in the quantum sense, but generative: a system whose rules produce a cosmos that is neither random nor predictable, but self-making.

Flipping Theory thus offers a vision of the universe as a vast automaton—not binary, but Gaussian; not discrete, but continuously updating; not finite, but bounded by its own conditions for existence.

In this view, mathematical automata are not metaphors.

They are the underlying logic of cosmic becoming.

The universe is computing itself through the laws of Flipping.

We are witnessing its output.

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