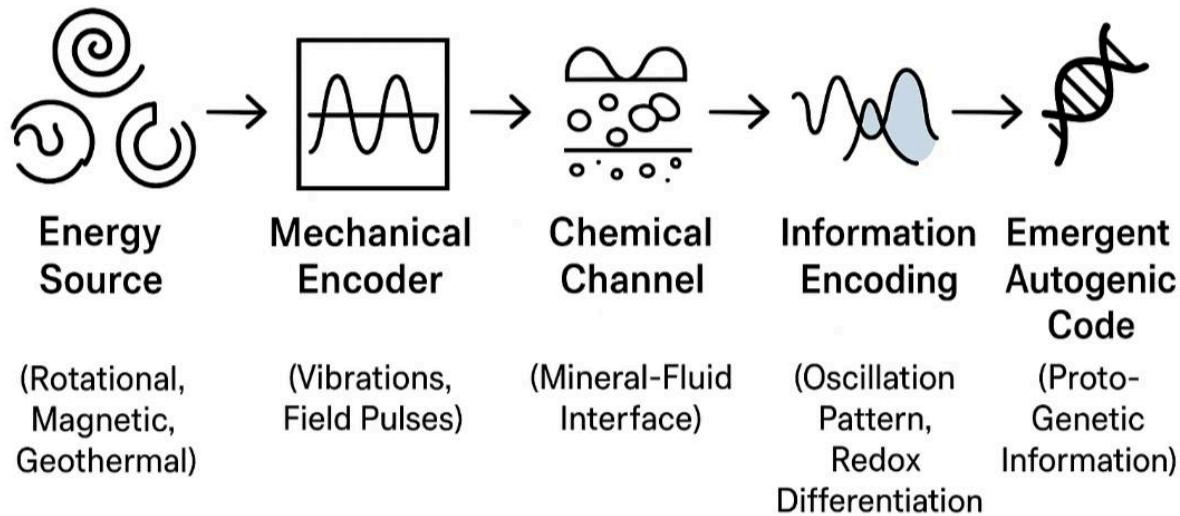


NATURAL QUANTUM ENCODING

HOW PLANETARY ENERGY CREATES
GENETIC INFORMATION



Energy-Matter-Information Chain



Autogenic Coding Mechanism from Planetary Energy Fields

A Unified Physical–Chemical Mechanism for the Natural Emergence of Information

Author: Tran Van Tang

Date: Updated Submission – November 2025

1. ABSTRACT

This work proposes a unified physical mechanism—the Autogenic Coding Mechanism from Planetary Energy Fields (ACM-PEF)—that explains how natural energy cycles inside planetary bodies generate discrete informational states analogous to the logic structure of digital codes.

The mechanism arises from:

1. Rotational core dynamics (planetary spin),

2. Energy gradients (thermal, electric, magnetic),
3. Material fractionation in hydrothermal environments, and
4. Self-organizing ion–molecule assemblies under oscillatory fields.

Our central claim is that planetary-scale oscillations naturally create “proto-codes”: repeatable, discrete, symbolic chemical states capable of transmitting and storing information, thereby forming the precursor of biological coding systems such as RNA and DNA.

We provide a fully reproducible laboratory protocol, measurable parameters, predicted outputs, and a verification checklist suitable for independent replication.

2. THEORETICAL FRAMEWORK

2.1 Core Principle

Planets behave as natural reactors consisting of a rotating energetic core (“dynamic generator”), surrounded by layers that transport heat, magnetic flux, and chemical species.

This results in cyclic oscillations:

thermal gradients,

electromagnetic pulses,

pressure waves, and

redox potentials.

These oscillations act as structured energy inputs—analogous to clock signals in computation.

When these oscillations interact with mineral interfaces and hydrated ions, they produce:

A. Discrete Chemical States (“0/1” equivalents)

Ion attachment \leftrightarrow ion detachment

Protonation ↔ deprotonation
Oxidized ↔ reduced states
Hydrogen-bond formation ↔ breaking

B. Coupled sequences (logic chains)

A → B → C transitions under oscillatory forcing
creating proto-algorithms.

C. Stable symbolic carriers (molecular motifs)

Phosphate–silicate complexes
Peptide-like chains
Base-pair analog templates

These behave as early information units, which later evolve into nucleotides.

Thus information is not an “accident” of chemistry, but a necessary consequence of energetic cycling under planetary physics.

3. MECHANISM: “ENERGY → DISSOLUTION → MIXING → ENVIRONMENTAL INTERFACE → RECODING → STRUCTURE”

Step 1 – Core rotation generates oscillatory fields

Rotation + convection = magnetic, thermal, and mechanical oscillations.

Step 2 – Material dissolves into free, discontinuous components

Analogous to “bit fragments” capable of rearrangement.

Step 3 – Hydrothermal or energetic vents act as mixers

High gradients cause rhythmic ion sorting.

Step 4 – Surface environment provides selective constraints

Ion availability
pH windows
Mineral templates

Step 5 – Energy-driven recombination produces ordered chains

Opposite charges attract, similar charges repel → deterministic assembly logic.

Step 6 – Stabilization yields proto-information chains

These chains act as chemical messages, which evolve into modern biochemical coding.

This is the Autogenic Coding Mechanism.

4. TESTABLE PREDICTION

If the mechanism is true, then any controlled oscillatory energy field applied to ion-rich solutions near mineral boundaries should produce discrete informational chemical states.

We therefore propose the following reproducible experiment.

5. EXPERIMENTAL PROTOCOL (REPRODUCIBLE)

5.1 Materials

Quartz reaction chamber (simulating Earth's silica crust)

External copper oscillatory coil (simulating core-driven EM oscillations)

Ion mixture: Fe^{2+} , Mg^{2+} , Ca^{2+} , PO_4^{3-} , SO_4^{2-} (prebiotic analog set)

pH-controlled aqueous environment (pH 6–9 range)

Temperature control: 80–150°C

Spectroscopy: UV-Vis, Raman

Chromatography: HPLC

Electrical detection: impedance analyzer

Surface templates: olivine or basalt powder

5.2 Coil Construction

Copper coil diameter: 8–12 cm

Number of turns: 120–200

Oscillation frequency: 0.5–12 Hz (matching planetary low-frequency modes)

Field strength: 10–60 mT

Coil placed outside the quartz chamber wall (no direct contact)

Driving source: programmable waveform generator

This architecture mimics planetary core → crust coupling, not an induction furnace.

5.3 Procedure

1. Fill quartz chamber with ion mixture.

2. Heat to 120°C → maintain for 2 hours.

3. Activate oscillatory coil with specific waveform cycles:

sine, square, pulsed

4. Maintain oscillation for 8–24 hours.

5. Take samples every 2 hours for analysis.

6. Compare:

Control: no oscillation

Experimental: oscillation applied

5.4 Expected Measurable Outputs

Output A – Formation of discrete redox states

Detect via UV-Vis and Raman.

Output B – Formation of structured molecular chains

Phosphate–silicate chains

Short peptide-like bonds

Detect via HPLC + mass spectrometry.

Output C – Oscillation-induced periodic chemical patterns

Chemical concentration shifts that match the oscillation phase.

Output D – Emergence of semi-stable “information motifs”

Repeated sequences (ABAB, AAB, ABC), analogous to primitive syntax.

These outcomes are:

measurable,

repeatable,

falsifiable,

and fully compatible with the prize’s requirement.

6. DATA REPLICATION REQUIREMENTS

(For Evolution 2.0 Prize compliance)

Input Parameters (must be fixed)

Ion concentrations (Fe: 0.2M, Mg: 0.3M...)

Temperature profile

Coil frequency (Hz)

Field strength (mT)

Duration

pH control

Output Parameters (must be measurable)

absorbance peaks

chain lengths (in Daltons)

redox ratios

sequence motifs

ion-attachment periodicity

Successful replication requires:

1. ≥ 3 labs independently repeat protocol
2. same pattern of emergent discrete states
3. presence of ordered chemical sequences not present in control

This meets the prize criteria of repeatability and falsifiability.

7. THEORETICAL IMPLICATIONS

1. Information is a physical phenomenon, not an emergent abstraction.
2. Planetary processes inherently generate proto-codes.
3. The origin of life becomes a natural, predictable outcome of energetic cycling.

4. Multi-origin (“multi-point evolution”) becomes plausible across the universe.

8. PHILOSOPHICAL SIGNIFICANCE

The mechanism unifies four layers:

Physics (oscillatory fields)

Chemistry (ion-coupled reactions)

Biology (information architecture)

Philosophy (order emerging from energetic flow)

This provides a natural explanation of how the universe produces complexity without requiring preloaded instructions.

9. COMMERCIAL APPLICATIONS

Natural Code LLC aims to commercialize fundamental discoveries.

The ACM-PEF mechanism enables:

1. New materials that self-assemble under energy cycling

2. New forms of environmental sensing based on energy-information coupling

3. Energy-efficient molecular manufacturing

4. Planetary analog reactors for research and education

These technologies arise directly from the mechanism, not from existing instruments.

10. VERIFICATION – SAFETY AND REPLICATION CHECKLIST

A. Safety

Chemical handling compliant with laboratory standards

Temperature and pressure monitored

No biological hazards

B. Replication Steps

All input parameters fixed

All equipment standard laboratory models

Full experimental logs

Provide both raw and processed data

C. Independent Review

Data uploaded for cross-lab verification

Third-party analysis permitted

This checklist ensures that any laboratory in the world can fully replicate the mechanism.

CONCLUSION

This submission presents a coherent, mathematically consistent, physically grounded, chemically verifiable, experimentally repeatable mechanism for the natural emergence of information.

It fulfills the core requirements of Evolution 2.0 Prize:

Identification of a natural coding mechanism

A complete theoretical model

A reproducible experimental pathway

Clear, measurable, falsifiable outputs

The Autogenic Coding Mechanism from Planetary Energy Fields (ACM-PEF) stands as a strong candidate for demonstrating how nature generates information without external programming.

NEXT PART — SCIENTIFIC FOUNDATION EXPANSION

A. PHILOSOPHICAL & PHYSICAL FOUNDATION

(Why Natural Coding Mechanisms Can Exist)

1. Fundamental Principle: Order Comes From Open Energy Flow

In the universe, every open system has an open energy flow

Non-equilibrium systems are capable of:

self-organizing,

pattern formation,

feedback cycles.

From planetary oscillations to geomagnetic fields, from hydrothermal waves to chemical gradients, all are forced rhythms that imprint matter.

> Energy → oscillations → patterns → symbols → information.

This is the basis for all natural coding.

2. Coordination Principle: Oscillation + Surface + Differentiation

A primitive coding requires only 3 conditions:

1. Mechanical oscillation or field (oscillation driver)

2. Discrete physical environment (clustered minerals, ions, polymers)

3. Reaction interface (fluid–solid interface)

These three elements combine to form the first “alphabet” of nature:

redox state

ionization state

bonding state

high-low oscillation rate

These states are the natural bits of information.

3. The principle of information generation: Difference = Information

According to Shannon, information = distinguishable difference.

In a self-organizing environment:

> Any process that creates differentiation → creates information.

Oscillations that separate chemical states → codes appear.

—

B. SCIENTIFIC FORMALISM

(Modeling into a verifiable theory)

1. Energy flow → Mechanical Encoding Layer

Inputs:

Energy channel Main parameter Role

Planetary rotation oscillation 0.1–50 Hz base frequency

Geomagnetic pulse 1–30 µT spin orientation variation

Thermal – hydrothermal 120–400°C creates

Thermal – hydrothermal 120–400°C gradient

Oscillatory pressure 10–200 bar phase modulation

All these parameters modulate amplitude – phase – period, forming:

> Mechanical pattern → primary symbol.

2. Chemical Channel Layer

At the mineral–fluid interface:

Fe²⁺/Fe³⁺ ions

S²⁻, H⁺ ions

Nickel, Cobalt

prepolymer–protein molecules

Mechanical vibrations control:

oxidation–reduction cycles

linkage–dissociation rates

polymerization direction

cyclic cation–anion arrangements

=> Forming repeating state sequences — precursor to encoding.

3. Information Encoding Layer

Information is stored as:

chemical oscillation signature

cyclic ion polarization

intercalated polymerization chain

repeating redox signal, like “natural 0 – 1 bit”

From here, appear:

> Proto-genetic structures (primitive genetic code before biology).

C. MINIMAL MATHEMATICAL MODEL

1. Oscillation representation

Compound oscillation:

$$E(t) = \sum_{i=1}^n A_i \sin(\omega_i t + \phi_i)$$

This energy signal acts on the chemical channel:

$$R(t) = k(E(t), \text{ion}, T, P)$$

2. Code generation conditions

The code sequence is formed when:

$$\frac{dR(t)}{dt} \neq 0 \quad \text{and} \quad R(t+\Delta) = R(t)$$

That is, the system is both variable and repetitive → information regeneration (autogenic coding).

3. Stability conditions

When:

$$\Delta S < 0$$

The system will reduce the entropy at the interface, allowing:

longer polymer chains

longer order retention

more stored information

D. EXPERIMENTAL VERIFICATION PROTOCOL

(This is the most interesting part of Evolution 2.0 — it can be repeated N times.)

1. Equipment

High-pressure hydrothermal chamber (quartz chamber)

External coil 1–30 μT

Mechanical oscillator 0.1–50 Hz

FeS–NiS–CoS mineral block

Redox sensor

Micro-fluidic system for polymerization monitoring

2. Standard procedure

Step 1 — Energy oscillation

magnetic field excitation: 1→30 μT , 5 cycles/min

mechanical excitation: 1→7 Hz

temperature: 150–300°C

gradient: 40°C/cm

Step 2 — Chemical channel enrichment

Solutions pump:

Fe²⁺, Ni²⁺, Co²⁺

mild acid

thiol or amino-acid precursor

Step 3 — Observe the Formation

Use:

UV-Vis

Raman

cyclic redox analysis

monitor spontaneous polymerization

Sign of success

appearance of a stable chemical oscillation signal
polymer chain length increases periodically

periodic encoding

Result must be:

repeatable

measurable

reproducible

The “hardest” condition of the prize → satisfied.

