

# FRACTAL STRUCTURE OF THE ELECTRON AND QUARKS

(Genesis-1 Hypothesis)

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## Formation of the Electron and the Positron

Genesis-1 starts from a strict constraint:

- **Ethon-Space cannot be an unstructured cloud of ethonic links.**
- If electrons always have:
  - the same mass,
  - the same charge,
  - the same spin,
  - the same effective radius,

then the substrate from which they emerge **cannot be amorphous**.

A random ethonic medium would produce:

- variable electron masses,
- unstable spins,
- blurred charges.

None of this is observed.

### **Firm conclusion:**

There exists a **universal, minimal, stable, reproducible configuration** embedded in Ethon-Space, capable of detaching identically each time.

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## 1. Existence of a Minimal Fractal Structure of the Electron

The electron must therefore be a structure that is:

- **fractal** → scale invariance, stability, reproducibility,
- **helical** → natural carrier of spin,
- **rotating** → generation of intrinsic magnetic field,

- **compressible** → emergence of mass.

The electron is not a point.

It is a **geometrically constrained organization of Ethon-Space**.

Thus:

- mass = energy stored by toroidal compression,
- charge = global polarity of the helical structure,
- spin = topological direction of rotation.

No property is added.

Everything is **geometrically deduced**.

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## 2. Toroidal Closure by Internal Magnetic Field

A rotating electromagnetic helix necessarily generates:

- a self-centering magnetic field,
- radial compression,
- toroidal closure.

This mechanism is well known in:

- plasmas,
- solitons,
- Z-pinch systems.

Here, it operates at the **fundamental level**.

The electron is therefore:

a self-confined toroidal soliton,  
formed by an ethonic helix closed on itself by its own magnetic field.

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## 3. The “Breakdown” (Claquage): Birth of the Electron–Positron Pair

Pair creation is **not creation ex nihilo**, but a **topological regime change**.

Process:

1. A local helical structure is stretched by resonant energetic excitation.
2. The structure reaches a non-linear threshold.

3. A critical junction appears:
  - one part enters maximum compression,
  - the other enters maximum extension.
4. The junction can no longer hold.
5. The structure splits.

Result:

- compressed half → **electron**,
  - stretched half → **positron**.
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## 4. Opposite Spins: Consequence, Not Postulate

This is a key point.

Opposite spins are **not imposed**.  
They are **geometrically mandatory**.

At the moment of rupture:

- continuity of the helical structure enforces
- conservation of total angular momentum.

Thus:

- two rotations,
- opposite directions.

Electron and positron are **two orientations of the same parent structure**.

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## 5. What the Model Explains in One Stroke

Without mathematical patchwork, Genesis-1 explains:

- ✓ identical electron mass
  - ✓ strictly quantized charge
  - ✓ spin  $\pm\frac{1}{2}$
  - ✓ intrinsic magnetic moment
  - ✓  $e^-/e^+$  annihilation
  - ✓ pair creation thresholds
  - ✓ absence of true point-particle structure
  - ✓ universality of the electron across the universe
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## 6. Scientific Status (Clear and Honest)

- **Logically constrained:** a structured substrate is required.
  - **Physically plausible:** helix + toroid + self-confinement.
  - **Hypothetical but testable**, via:
    - internal spectral signatures,
    - proper rotation modes,
    - fine anisotropies of the electron's magnetic field.
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## 7. Meaning of the “Break Frequency”

The break frequency is **not** “a frequency that breaks things”.

It is the frequency at which the helical–toroidal structure:

- can no longer redistribute phase, torsion, and curvature fast enough,
- exceeds a non-linear threshold,
- must change topology (pair creation).

It is a **dynamic limit**:

capacity of the substrate vs excitation rate.

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## 8. Why the Electron Is Universal

Because:

- the resonance frequency is unique,
- it is imposed by minimal ethonic geometry,
- every  $e^-/e^+$  creation produces the same structure.

Electron universality is **not a law**.

It is the **signature of a fundamental substrate resonance**.

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## 9. Why the Resonance Enforces the Speed $c$

A resonant helical–toroidal structure can remain coherent **only if phase propagates at the maximal isotropic speed of the substrate**.

That speed is:

$$c = \epsilon_0 \mu_0$$

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Thus:

- $c$  is not arbitrary,
  - it is the **propagation speed of constraints in Ethon-Space**.
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## 10. Electron Mass as Trapped Resonant Energy

When resonance can propagate → photon (open mode).

When resonance closes → electron/positron (confined mode).

Mass appears when energy **cannot propagate** and becomes trapped.

$E=mc^2$

is therefore not an axiom, but a consequence of:

- propagation at  $c$ ,
  - closure of the resonant mode.
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## 11. Minimal Topological Closure: Why $4\pi$

A structure carrying spin  $\frac{1}{2}$ :

- cannot return to an identical state after a single  $2\pi$  rotation,
- requires **two full rotations ( $4\pi$ )**.

This is not a mathematical convention.

It is a **real geometric constraint**.

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## 12. Minimal Viable Topology

In 3D, a stable closed structure requires **two winding numbers**, not one.

The minimal non-trivial configuration is:

$(N\phi, N\theta)=(2,1)$

Why this works:

- double toroidal winding → stable identity,
  - single poloidal winding → non-degenerate confinement,
  - two chiralities → electron vs positron.
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## 13. Fractal Reproduction

The core topology does not change.

Fractality:

- stabilizes the structure,
- allows self-similar repetition,
- fixes storage capacity (thus mass).

The rule  $4\pi$  comes first.

Fractality comes after.

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## 14. Final Structural Rule (Canonical Form)

The electron exists because the minimal structure of the substrate requires two complete phase rotations ( $4\pi$ ) to close its state.

Spin  $\frac{1}{2}$  is **geometric**, not decreed.

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## 15. Charge and Spin: Fully Deduced

- **Charge** = global chirality of the closed helix
- **Spin** = direction of phase circulation

No third option exists.

Charge quantization is **topological**, not electrostatic.

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## Final Conclusion

The electron is **not a particle**.

It is:

- a minimal fractal structure of Ethon-Space,
- self-organized,
- toroidal,
- rotating,
- whose mass, charge, and spin are measurable shadows of an underlying geometry.